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ABSTRACT

This secondary vocational agricultural curriculum guide is one of a set of four designated as the basic core of instruction for vocational agriculture programs in Kansas. Units of instruction are presented in six sections: (1) Orientation and Careers, (2) Leadership, (3) Supervised Experience Programs, (4) Animal Science, (5) Plant and Soil Science, and (6) Agricultural Mechanics. Each unit is comprised of the following parts: terminal objectives, specific objectives, orientation with suggested instructor and student activities and references, information sheets, assignment sheets, unit test, and unit test answers. (YLB)

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FOREWORD

This publication is one of a set of four designated as the basic core of instruction for programs of Vocational Agriculture in Kansas. The Kansas Core will provide teachers of Vocational Agriculture with direction in the development and delivery of an instructional program for secondary agricultural students within the state.

Kansas is an agricultural production state. Its economy is dependent upon the ability to produce an abundance of raw agricultural products. The Kansas Core with localized information will provide students with technical information necessary to enter into the business of farming or ranching. The information contained in these publications must be supplemented with a well planned supervised farming program.

Since the majority of the off-farm agricultural occupations are closely associated with production agriculture the Kansas Core properly supplemented with information directly related to the student selected occupation may serve as a basic core to preparing for an off-farm agricultural occupation. Supervised occupational experience in the student's chosen occupation is a necessary component for an off-farm agricultural education program.

Appreciation is expressed to the Oklahoma State Board for Vocational and Technical education for permission to adapt the Oklahoma Core to Kansas conditions. Appreciation is also expressed to Dr. Ralph Field, Kansas State University, and the Vocational Agriculture teachers who dedicated their time to adapting the Oklahoma Core to Kansas conditions and to the writing of new units which are included in this publication.

Dean Prochaska, Director
Agricultural Education

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ACKNOWLEDGMENTS

Appreciation is expressed to many individuals for their assistance in the preparation of this publication. As the basic content is built on the Vocational Agriculture I, Oklahoma Curriculum Guide, special thanks are extended to the Oklahoma Curriculum and Instructional Materials Center personnel for their permission to reproduce and change their material, and especially to Bob Patton for his assistance in this modification and preparation.

Without the combined efforts of the Vocational Agriculture Section, State Department of Education, the Agricultural Education Section, Kansas State University, and the vocational agriculture teachers in KVATA, this publication would not have been possible.

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This publication was prepared under the supervision of Ralph Field, Agricultural Education Teacher Educator, Kansas State University.

ORIENTATION TO VOCATIONAL AGRICULTURE
UNIT I

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to match terms associated with vocational agriculture to the proper definition and discuss the importance of vocational agriculture in his future as well as the opportunities for personal development offered by vocational agriculture and FFA. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with orientation to vocational agriculture to their correct definition.
2. List three reasons for studying vocational agriculture.
3. List the responsibilities of being a student in vocational agriculture.
4. List four groups of people that vocational agriculture trains and serves.
5. List three activities in which FFA members can participate.
6. Select from a list the areas to be covered (studied) in Vocational Agriculture I.
7. Match the proper description and/or activity with the FFA contest.
8. Match the requirements for the various FFA degrees with the degree.
9. List five awards available through the FFA awards program
10. Select from a list types of projects most commonly exhibited at fairs and shows by FFA members.
11. Explain in writing why vocational agriculture is vocational in nature.
12. Prepare a list of the more important agricultural enterprises in your home community.

ORIENTATION TO VOCATIONAL AGRICULTURE
UNIT I

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information sheet
3. Discuss terminal and specific objectives
4. Discuss information and assignment sheets
5. Advise students about due date for applications
6. Give test

Student:

1. Read objective sheet
2. Study information sheet and take additional notes
3. Complete assignment sheet
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheet
3. Assignment sheet
   #1--List of Important Agricultural Enterprises in Community
4. Test
5. Answers to test

References:

1. Agriculture is More Than Farming, prepared by the American Association of Teacher Educators in Agriculture, the National Association of Agricultural Education Supervisors, and the National Vocational Agricultural Teacher's Association, Inc., The Future Farmers Supply Service, Alexandria, Virginia.

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3. Krebs, Alfred H. Agriculture in Our Lives. Danville, Illinois: Interstate Printers and Publishers, 1972.

4. Official Manual, Future Farmers of America, Alexandria, Virginia, 1974.

5. FFA Advisors Handbook, Future Farmers of America, Alexandria, Virginia, 1975.

6. State High School Agricultural and Agricultural Mechanics Contests, annual publication of the State High School Agricultural and Agricultural Mechanics Contest Committee, Agriculture Education Department, Kansas State University, Manhattan, Kansas.

7. Kansas FFA Activities and Awards Opportunities, State Department of Education, Agriculture Education, Topeka, Kansas, 1976.

ORIENTATION TO VOCATIONAL AGRICULTURE
UNIT I

INFORMATION SHEET

I. Terms and definitions

   A. Vocational agriculture--Training program to teach young people about the science of agriculture and/or agricultural related occupations and to prepare them for furthering their education or entry into the world of work

   B. Agriculture--Science or art of cultivating the soil, producing crops, raising livestock, and all other aspects created as these products move from producer to consumer

   C. Agricultural related occupations (Agribusiness)--Those operating units that support production agriculture in such ways as marketing processing, and servicing

   D. Future Farmers of America (FFA)--An organization of national scope for students enrolled in vocational agriculture programs designed to provide training in leadership, citizenship, and cooperation and to compliment the total program

II. Reasons for studying vocational agriculture

   A. Importance of national food supply

   B. Awareness of nation's economy

   C. Daily use of farm products

   D. Understanding of agricultural related business

   E. Choice of an occupation

   F. Wise usage of our natural resources

   (NOTE: The nature of today's agriculture requires that students be trained in the sciences dealing with animals, plants, and soils, as well as principles of breeding, feeding, disease, and insect control. In every school, instruction is prepared so that it meets the needs of students. Whatever a student ultimately decides to do, the willingness to accept responsibility and to make decisions based on what he has learned in vocational agriculture will be valuable to him.)

III. Responsibilities of vocational agriculture students

   A. Attend classes

INFORMATION SHEET

B. Carry on a supervised occupational experience program

(NOTE: It is this aspect of vocational agriculture that makes it vocational in nature. By having a farming program or gaining work experience in an agricultural business, students become acquainted with the world of work and begin to recognize the importance of preparing for a vocation.)

C. Become an active member of the Future Farmers of America

D. ____________________________(To be completed by local schools)

IV. Groups that vocational agriculture trains and serves

A. High school students planning to farm

B. High school students planning to work in agricultural-related occupations

C. Young adults establishing themselves in farming

D. Farmers improving their operations

V. FFA activities

A. FFA meetings

B. Committee work

C. Leadership conferences

D. Contests

E. Livestock shows and fairs

F. State and national conventions

G. Parent-Member banquet

H. Field trips

I. Local, state, and national awards

VI. Major areas of instruction for Vocational Agriculture I

A. Orientation and careers

1. Agriculture occupations

2. Choosing your career

INFORMATION SHEET

B. Leadership

1. Future Farmers of America

2. Parliamentary procedure

3. Public speaking

C. Supervised occupational experience program

1. Exploring areas of interest

2. Goals

3. Beginning record keeping

D. Animal Science

1. Livestock industry

2. Breeds of livestock

3. Livestock selection

4. Livestock feeding

E. Plant and soil science

1. Plant and seed identification

2. Importance of crop production

F. Agricultural mechanics

1. Orientation

2. Fasteners

3. Arc welding

4. Gas welding

5. Metal work

6. Hacksaws, files, and miscellaneous

7. Safety

VII. Contests for the FFA members

A. Livestock Judging--Ability to select animals for breeding and marketing purposes

INFORMATION SHEET

B. Crops Judging--Ability to identify and judge all types of plants and seeds common to the local community and to Kansas

C. Land Judging--Ability to identify the various types of soils and land classes and make land use recommendations

D. Meats Judging--Ability to select meat cuts and evaluate carcasses

E. Agricultural Newswriting--Ability to perform correct journalism skills

F. Parliamentary Procedure--Ability to conduct an effective and efficient chapter meeting according to the correct rules of parliamentary procedure

G. Public Speaking--Ability to write and deliver speeches

H. FFA Quiz--Ability to answer questions that test one's knowledge of the Future Farmers of America

I. Agricultural Electrification--Ability to identify electrical equipment and perform simple wiring skills

J. Agricultural Structures and Environment--Ability to lay out buildings or structures designed to meet certain specifications

K. Agricultural Mechanic Skills--Ability to identify tools and perform basic Mechanical skills

L. Farm Power and Machinery--Ability to identify parts and perform basic tasks concerning farm machinery

M. Soil and Water Management--Ability to evaluate and understand irrigation systems and conservation practices

N. Dairy Cattle Judging--Ability to select cattle for dairy production

O. Dairy Products Judging--Ability to evaluate dairy products

P. Poultry Judging--Ability to select and evaluate the different classes of poultry including egg production

Q. Entomology--Ability to identify and answer basic questions about different types of insects

R. Horticultural Judging--Ability to identify and judge various classes of horticultural plants

S. Creed Speaking--Ability of freshman to deliver the FFA Creed

INFORMATION SHEET

VIII. FFA degrees that can be earned

A. Greenhand Degree

1. Awarded by the local chapter signifying achievement of the first level of membership

2. Qualifications for the degree

   a. Be enrolled in vocational agriculture and have plans for a supervised training program in agriculture

   b. Be familiar with the aims and purposes of the FFA

   c. Recite the FFA Creed

   d. Receive a majority vote from the local chapter members

(NOTE: Star Greenhand--Awarded by the local chapter to the most outstanding Greenhand or freshman student)

B. Chapter Farmer Degree

1. Awarded by the local chapter signifying achievement of the second level of membership

2. Qualifications for the degree

   a. Must have received the Greenhand Degree

   b. Must have completed one semester of instruction in vocational agriculture

   c. Must have earned at least $50 from a supervised training program or worked 50 hours

(NOTE: Chapter Star Farmer and Star Agribusinessman--Awarded at the local level to the most outstanding member in the chapter in his/her training program area; selected from the Chapter Farmers

C. State Farmer Degree

1. Awarded to the top 2% of the FFA members in the state each year

2. Qualifications for the degree

   a. Must have been in the FFA for at least two years

   b. Must have earned at least $500 from a supervised training program or worked 600 hours

INFORMATION SHEET

c. Must be able to lead a group discussion for at least 40 minutes

d. Must participate in activities above the chapter level

(NOTE: District Star Farmer and Star Agribusinessman--Awarded at the district level to the most outstanding member in leadership, scholarship, and supervised agricultural training program; selected from the State Farmers in that district

(NOTE: State Star Farmer and Star Agribusinessman--Awarded to the outstanding FFA member in the state in his/her training program area; must have received the State Farmer Degree

D. American Farmer Degree

1. Awarded to the top FFA members in the nation

   (NOTE: Only 1 in 1,000 receives the American Farmer Degree approximately)

2. Qualifications for the degree

   a. Must have received the State Farmer Degree

   b. Must have been an active FFA member for at least 36 months

   c. Must have earned at least $1,000 from a supervised training program

(NOTE: Regional Star Farmer and Star Agribusinessman--Selected from the American Farmers in the four regions from his/her training program area; awarded to four members yearly in the United States

(NOTE: Star Farmer and Star Agribusinessman of America:

1. Awarded to the outstanding FFA member in the nation in his/her training program area

2. Must have achieved the American Farmer Degree

3. Awarded annually at the National FFA Convention

4. Qualifications for the award

   a. Must list career goals

INFORMATION SHEET

c. Must list and describe skills and/or competencies developed through an occupational experience program

d. Must describe the managerial responsibilities assumed

e. Must provide an annual summary of total hours worked each year and/or income received

f. Must itemize investments and other resources accumulated

g. Must be recommended by his/her state association

IX. Awards available on the local, state, and national levels

A. Individual Foundation Awards

1. Agricultural Mechanics
2. Agricultural Electrification
3. Soil, Water, and Air Management
4. Crop Production
5. General Livestock Production
6. Beef Production
7. Sheep Production
8. Swine Production
9. Dairy Production
10. Poultry Production
11. Home Improvement
12. Ornamental Horticulture
13. Outdoor Recreation
14. Fish and Wildlife Management
15. Forestry Management
16. Placement in Sales and/or Service

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17. Placement in Agricultural Production
18. Placement in Processing
19. FFA Public Speaking
20. Star State Farmer
21. Star State Agribusinessman
22. Star Farmer of America
23. Star Agribusinessman of America

B. Chapter Foundation Awards

1. Better Chapter
    a. State Level
        1) Superior Awards
        2) Gold Emblem Awards
    b. National level
        1) Bronze Awards
        2) Silver Awards
        3) Gold Awards
2. Chapter Safety
    a. State Level--Superior Awards
    b. National Level
        1) Bronze Awards
        2) Silver Awards
        3) Gold Awards
3. Building Our American Communities
    a. State Level
        1) Bronze Awards
        2) Silver Awards
        3) Gold Awards
    b. National Level

INFORMATION SHEET

      1) Bronze Awards
      2) Silver Awards
      3) Gold Awards

  C. Chapter Improvement Awards
    1. Membership Achievement Awards
    2. State Scrapbook Contest

  D. Individual Improvement Awards
    1. Livestock Conservation Awards
    2. Grass and Grain Record Keeping Awards
    3. Kansas Cooperative Council Awards
    4. Wildlife Damage Control
    5. Acres for Wildlife
    6. Kansas Future Farmer Award
    7. National FFA Band and Chorus

  E. Scholarships
    1. Santa Fe Railway
    2. Roy Freeland, Harry Darby Scholarship
    3. Hesston Scholarship
    4. Charolois Scholarship
    5. Hereford Scholarship
    6. Angus Scholarship
    7. Alpha Gamma Rho Scholarship

X. Common projects exhibited at fairs and shows
  A. Market steers
  B. Beef breeding
  C. Market swine

INFORMATION SHEET

D. Swine breeding

E. Market lambs

F. Sheep breeding

G. Dairy

H. Crops exhibits such as seeds or plants

I. Mechanic exhibits

(NOTE: Students enrolled in vocational agriculture and the FFA have the opportunity to exhibit projects at livestock shows and fairs. Most all types of crops and livestock can be exhibited at the fairs and shows.)

XI. Nature of vocational agriculture

A. Supervised occupational experience programs

1. Actual "hands on" type of experiences

2. Real life experiences

3. Learn by doing

B. Preparing for a vocation

ORIENTATION TO VOCATIONAL AGRICULTURE
UNIT I

ASSIGNMENT SHEET #1--LIST OF IMPORTANT AGRICULTURAL ENTERPRISES IN COMMUNITY

Prepare a list of the more important agriculture enterprises in your community. (Discuss this with your instructor after the list is complete.)

ORIENTATION TO VOCATIONAL AGRICULTURE
UNIT I

TEST

1. Match terms on the right with their correct definition.

_____a. An organization of national scope for students enrolled in vocational agriculture programs designed to provide training in leadership, citizenship, and cooperation and to compliment the total program

_____b. Those operating units that support production agriculture in such ways as marketing, processing, and servicing

_____c. Science or art of cultivating the soil, producing crops, raising livestock, and all other aspects created as these products move from producer to consumer

_____d. Training program to teach young people about the science of agriculture and/or agricultural related occupations and to prepare them for futhering their education or entry into the world of work

1. Vocational agriculture
2. Agriculture
3. Future Farmers of America
4. Agricultural related occupations (Agribusiness)

2. List three reasons for studying vocational agriculture.

a.

b.

c.

3. List the responsibilities of being a student in vocational agriculture.

a.

b.

c.

d.

4. List four groups of people that vocational agriculture serves and trains.

a.

b.

c.

d.

5. List three activities in which FFA members can participate.

a.

b.

c.

6. Place an "X" by the areas to be covered in Vocational Agriculture I.

_____a. Library science

_____b. Agriculture mechanics

_____c. Chemicals

_____d. Careers

_____e. Leadership

_____f. Political science

_____g. Animal science

_____h. Plant science

_____i. Supervised occupational experience

_____j. Animal reproduction

7. Match the contests on the right with the proper descriptions and/or activities on the left.

_____a. Identifying vegetables

_____b. Land capability classes

_____c. Welding

_____d. Laying out a building

_____e. Wiring

_____f. Evaluating carcasses

1. Horticultural judging
2. Livestock Judging
3. Crops Judging
4. Poultry Judging
5. Agricultural Mechanics Contest
6. Parliamentary Procedure

_____g. Conducting business

_____h. Insect identification

7. Agricultural Electrification Contest
8. Land Judging
9. Agricultural Structures and Environment Contest
10. Dairy Products Judging Contest
11. Entomology Contest
12. Meats Judging Contest

8. Match the degree on the right with its proper set of requirements by placing the letter which represents that degree in the correct blank.

G=Greenhand

C=Chapter Farmer

S=State Farmer

A=American Farmer

_____a.
1) Awarded by local chapter signifying achievement of the first level of membership
2) Be enrolled in vocational agriculture
3) Recite the FFA creed
4) Be familiar with the aims and purposes of the FFA
5) Receive a majority vote from local chapter members

_____b.
1) Awarded to top FFA members in the nation
2) Must have received the State Farmer Degree
3) Must have been an active FFA member for at least 36 months
4) Must have earned at least $1000 from a supervised experience program

_____c.
1) Awarded to top 2% of the FFA members in the state each year
2) Must have been in the FFA for at least two years
3) Must have earned at least $500 from a supervised experience program or worked 600 hours

4) Must participate in activities above the chapter level

_____d. 1) Awarded by local chapter signifying achievement of the second level of membership

2) Must have received the degree of Greenhand

3) Must have completed one semester of instruction in vocational agriculture

4) Must have earned at least $50 from a supervised experience program or worked 50 hours

9. List five individual foundation awards available through the FFA awards program.

a.

b.

c.

d.

e.

10. Place an "X" by the projects most commonly exhibited at fairs and shows by FFA members.

_____a. Hot rod car

_____b. Market steers

_____c. Market horses

_____d. Market swine

_____e. Market sheep

_____f. Ewe lambs

_____g. Gilts

_____h. Heifers

_____i. Crops

_____j. Clothing

_____k. Dairy animals

_____l. Plants

_____m. Airplanes

_____n. Mechanics projects

11. Explain in writing why vocational agriculture is vocational in nature.

12. Prepare a list of the more important agricultural enterprises in your community.

(NOTE: If this has not been accomplished prior to the test, ask the instructor when the above activity should be completed.)

ORIENTATION OF VOCATIONAL AGRICULTURE
UNIT I

ANSWERS TO TEST

1. a. 3

   b. 4

   c. 2

   d. 1

2. Any three of the following

   a. Importance of national food supply

   b. Awareness of nation's economy

   c. Daily use of farm products

   d. Understanding of agricultural related business

   e. Choice of occupation

   f. Wise usage of our natural resources

3. a. Attend classes

   b. Carry on a supervised occupational experience program

   c. Become an active member of the Future Farmers of America

   d. (Local requirements)

4. a. High school students planning to farm

   b. High school students planning to work in agricultural-related occupations

   c. Young adults establishing themselves in farming

   d. Farmers improving their operations

5. Any three of the following

   a. FFA meetings

   b. Committee work

   c. Leadership conferences

  - d. Contests
  - e. Livestock shows and fairs
  - f. State and national conventions
  - g. Parent-Member banquets
  - h. Field trips
  - i. Local, state, and national awards

6. b, d, e, g, h, i
7. a. 1
   - b. 8
   - c. 5
   - d. 9
   - e. 7
   - f. 12
   - g. 6
   - h. 11
8. a. G
   - b. A
   - c. S
   - d. C
9. Any five of the following
   - a. Individual Foundation Awards
     - 1) Agricultural Mechanics
     - 2) Soil, Water, and Air Management
     - 3) Dairy Producation
     - 4) Crop Production
     - 5) Livestock Production
     - 6) Forestry Management
     - 7) Poultry Production

8) Agricultural Electrification
9) Placement in Sales and/or Services
10) Fish and Wildlife Management
11) Placement in Agricultural Production
12) Placement in Processing
13) FFA Public Speaking
14) State Star Farmer
15) State Star Agribusinessman
16) Star Farmer of America
17) Star Agribusinessman of America
18) Ornamental Horticulture
19) Beef Production
20) Swine Production
21) Sheep Production
22) Outdoor Recreation
23) Home Improvement

10. b, d, e, f, g, h, i, k, l, n,

11. Explanation should include the following

a. Supervised occupational experience programs
    1) Actual "hands on" type of experiences
    2) Real life experiences
    3) Learn by doing

b. Preparing for a vocation

12. Evaluated to the satisfaction of the instructor.

CAREERS IN AGRICULTURE
UNIT II

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to identify items to be considered when selecting a career and describe the process by which a person chooses an occupation. He should be able to discuss job opportunities in the different areas of agriculture. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with careers with their correct definitions.
2. Select from a list the items to be considered in choosing a career.
3. List three points to consider when selecting any given occupation.
4. Match the occupations in agriculture with its occupational area.
5. Rank in order the income of agricultural enterprises in the United States.
6. Discuss in a short paragraph the economic statistics of the farm industry.
7. Complete the social security application form and secure a social security number.

CAREERS IN AGRICULTURE
UNIT II

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information and assignment sheets
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information and assignment sheets
6. Secure social security application forms for each student
7. Give test

(NOTE: The teacher may wish to take the class and visit various businesses in the community to assist in teaching agricultural occupations. As a basis for providing information useful in guidance, the teacher may also wish to administer the Vocational Agriculture Interest Examination, available from Interstate Printers, and/or have each student write an autobiography of himself and his interests to be placed on file.)

Student:

1. Read objectives
2. Study information sheet and take notes
3. Complete assignment sheet. (apply for social security number)
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheet
3. Transparency masters
   TM 1--Production-Distribution Cycle and Number Employed
   TM 2--Sample Social Security Card
4. Assignment Sheet
   #1--Complete Social Security Application Form
5. Test
6. Answers to test

References:

1. Agriculture is More Than Farming, prepared by the American Association of Teacher Educators in Agriculture, The National Association of Agricultural Education Supervisors, and The National Vocational Agricultural Teacher's Association, Inc., The Future Farmers Supply Service, Alexandria, Virginia.

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CAREERS IN AGRICULTURE
UNIT II

INFORMATION SHEET

I. Terms and definitions

   A. Agricultural industry (Agindustry)--Refers collectively to: (1) the industries producing agricultural commodities, (2) the industries and businesses supplying and servicing those engaged in agricultural commodity production, and (3) the industries and buisnesses performing all the necessary functions in making agricultural commodities available to the consumer

   B. Agribusiness--Refers to the business of producing, processing, and marketing feed and food with the aid that modern science, engineering, industry, finance, and trade can provide

   C. Career--The total pattern of jobs or activities performed during a person's lifetime

   D. Occupation--A person's regular work, business, or means of earning a living

   E. Job--The specific work a person performs

II. Items to consider in choosing a career

   A. Likes, dislikes, and abilities

   B. Interests and abilities

   C. Various occupations in agriculture

   D. Occupational possibilities in the different areas of agriculture

   E. Education and experience requirements for entry into the occupation

   F. Responsibility demands for various careers

III. Points to consider in selecting any given occupation

   A. Type of work

      1. Inside or outside

      2. Degree of responsibility

   B. Working conditions

      1. Hazards or surroundings

      2. Child Labor Laws

INFORMATION SHEET

- C. Training requirements
- D. Possible salaries
- E. Opportunities for advancement

IV. Occupational opportunities in agriculture (Transparency 1)

- A. Agriculture production
  1. Farm or ranch owner/operator
  2. Farm manager
  3. Hatchery operator
- B. Agricultural supplies
  1. Grain elevator manager/employee
  2. Salesman
  3. Product development engineer or scientist
  4. Custom operator
- C. Agricultural Products
  1. Quality control supervisor
  2. Warehouse or shipping manager
  3. Processed food salesman
  4. DHIA tester
  5. Livestock buyer
  6. Food inspector
- D. Ornamental horticulture
  1. Nurseryman
  2. Florist
  3. Landscape aide
  4. Golf course employee
  5. Greenhouse operator

INFORMATION SHEET

E. Agricultural resources
  1. Soil conservationist
  2. Wildlife conservationist
  3. Fish hatcheryman
  4. Recreation farm manager

F. Agricultural education
  1. High school teacher
  2. College teacher
  3. Area extension director
  4. Farm loan officer
  5. Farm insurance adjustor

G. Agricultural mechanics
  1. Welder
  2. Agricultural machinery mechanic/employee
  3. Farm equipment operator
  4. Agricultural representative for electrical company or co-op

H. Forestry
  1. Forester
  2. Saw mill operator
  3. Christmas tree grower

V. Income of agricultural enterprises in United States

(1971) Enterprise	Income (millions of $)
A. Meat animals	25,257
B. Feed grains and hay	13,882
C. Oil bearing crops	9,604

INFORMATION SHEET

D.	Dairy products	9,399
E.	Food grains	9,276
F.	Poultry and eggs	6,285
G.	Vegetables	5,358
H.	Fruits and nuts	3,476
I.	Cotton and cottonseed	2,975
J.	Tobacco	2,146
	Total farm income 1971	
	Crops	52,097
	Livestock and livestock products	41,424
	Government payments	530
	Total	94,051

VI. Economic status of farm industry in United States

A.	Farm population	9,264,000
B.	Number of farms	2,818,580
C.	All land in farms (acres)	1,086,375,000
D.	Average acreage/farm	385
E.	Value of farm property (land buildings)	370.1 billion
F.	Net income per farm	9,789
G.	Farmers average share of retail cost approximately: (farm value ÷ retail cost)	40%

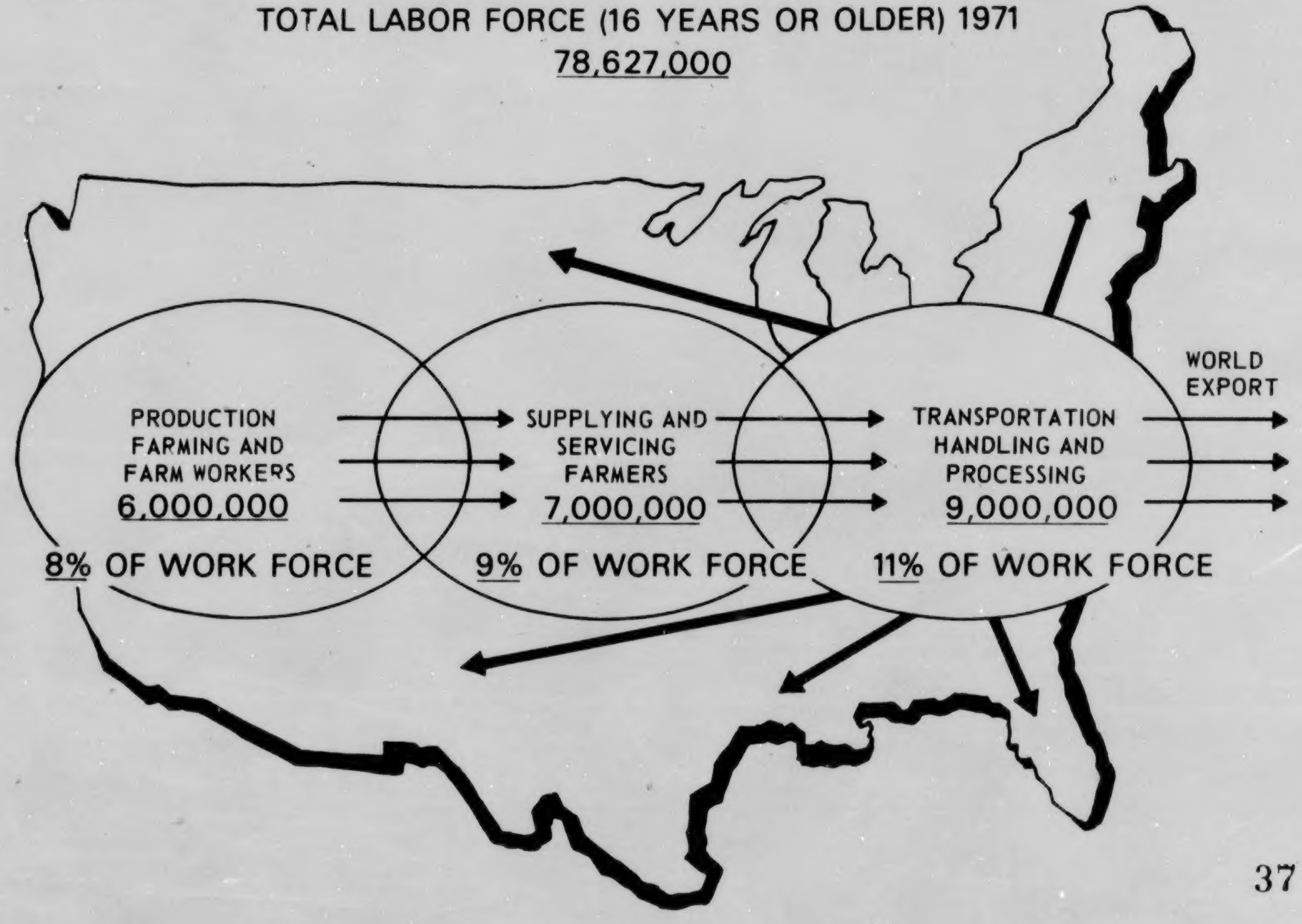
VII. Social security form (Transparency 2)

(NOTE: Teacher should provide actual S.S. application forms for all who do not have a S.S. number.)

Production-Distribution Cycle and Number Employed

TOTAL LABOR FORCE (16 YEARS OR OLDER) 1971

78,627,000



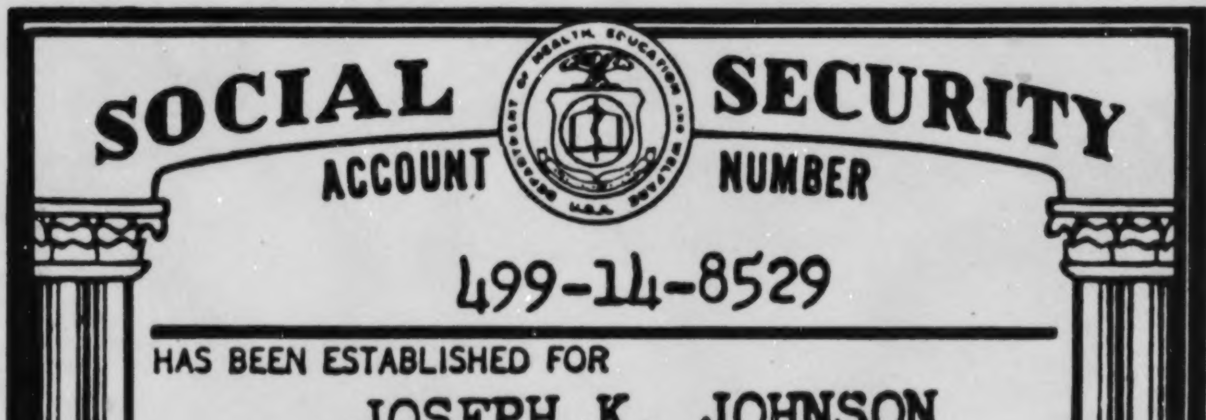
PRODUCTION FARMING AND FARM WORKERS
6,000,000
8% OF WORK FORCE

SUPPLYING AND SERVICING FARMERS
7,000,000
9% OF WORK FORCE

TRANSPORTATION HANDLING AND PROCESSING
9,000,000
11% OF WORK FORCE

WORLD EXPORT

Sample Social Security Card



SOCIAL SECURITY

ACCOUNT NUMBER

DEPARTMENT OF HEALTH EDUCATION AND WELFARE U.S.A.

499-14-8529

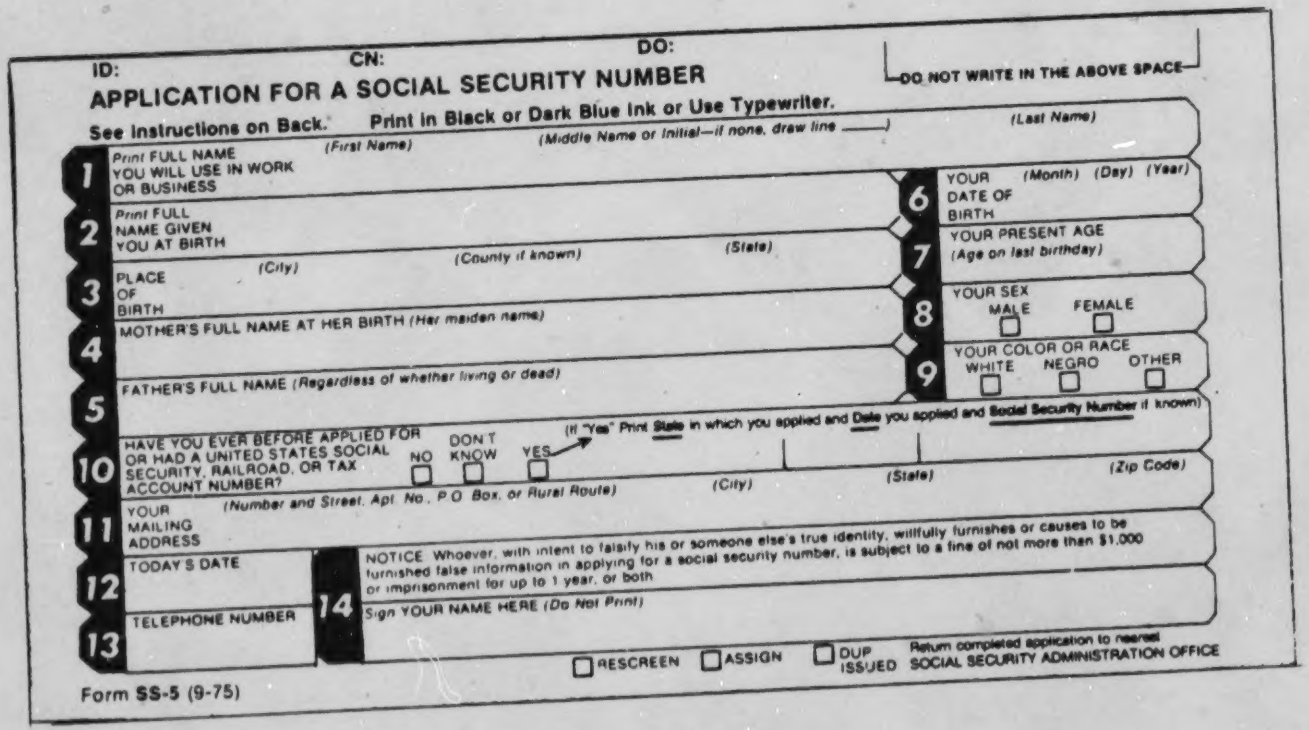
HAS BEEN ESTABLISHED FOR

JOSEPH K. JOHNSON

SIGNATURE Joseph K. Johnson

FOR SOCIAL SECURITY AND TAX PURPOSES—NOT FOR IDENTIFICATION

ASSIGNMENT SHEET #1—COMPLETE SOCIAL SECURITY APPLICATION FORM



ID: CN: DO:

DO NOT WRITE IN THE ABOVE SPACE

APPLICATION FOR A SOCIAL SECURITY NUMBER

See Instructions on Back. Print in Black or Dark Blue Ink or Use Typewriter.

1 Print FULL NAME YOU WILL USE IN WORK OR BUSINESS *(First Name)* *(Middle Name or Initial—if none, draw line ——)* *(Last Name)*

2 Print FULL NAME GIVEN YOU AT BIRTH

3 PLACE OF BIRTH *(City)* *(County if known)* *(State)*

4 MOTHER'S FULL NAME AT HER BIRTH *(Her maiden name)*

5 FATHER'S FULL NAME *(Regardless of whether living or dead)*

6 YOUR DATE OF BIRTH *(Month)* *(Day)* *(Year)*

7 YOUR PRESENT AGE *(Age on last birthday)*

8 YOUR SEX MALE ☐ FEMALE ☐

9 YOUR COLOR OR RACE WHITE ☐ NEGRO ☐ OTHER ☐

10 HAVE YOU EVER BEFORE APPLIED FOR OR HAD A UNITED STATES SOCIAL SECURITY, RAILROAD, OR TAX ACCOUNT NUMBER? NO ☐ DON'T KNOW ☐ YES ☐ → (If "Yes" Print State in which you applied and Date you applied and Social Security Number if known)

11 YOUR MAILING ADDRESS *(Number and Street, Apt. No., P.O. Box, or Rural Route)* *(City)* *(State)* *(Zip Code)*

12 TODAY'S DATE

13 TELEPHONE NUMBER

14 NOTICE: Whoever, with intent to falsify his or someone else's true identity, willfully furnishes or causes to be furnished false information in applying for a social security number, is subject to a fine of not more than $1,000 or imprisonment for up to 1 year, or both.

Sign YOUR NAME HERE *(Do Not Print)*

☐ RESCREEN ☐ ASSIGN ☐ DUP ISSUED

Return completed application to nearest SOCIAL SECURITY ADMINISTRATION OFFICE

Form SS-5 (9-75)

CAREERS IN AGRICULTURE
UNIT II

TEST

1. Match the term on the right with its correct definition.

_____a. The total pattern of jobs or activities performed during a person's lifetime

_____b. A person's regular work, business, or means of earning a living

_____c. The specific work a person performs

_____d. Refers collectively to (1) the industries producing agricultural commodities, (2) the industries and businesses supplying and servicing toose engaged in agricultural commodity production, and (3) the industries and businesses performing all the necessary functions in making agricultural commodities available to the consumer

_____e. Refers to the business of producing, processing, and marketing feed and food with the aid that modern science, engineering, industry, finance, and trade can provide

1. Agricultural Industry
2. Agribusiness
3. Career
4. Occupation
5. Job

2. Place an "X" in front of items that should be considered in choosing a career.

_____a. Likes, dislikes, and abilities

_____b. Interests and abilities

_____c. Retirement

_____d. Fringe benefits

_____e. Various occupations in agriculture

_____f. Education and experience requirements for entry into the occupation

3. List three points to consider when selecting any given occupation.

   a.

   b.

   c.

4. Match the areas of agriculture on the right with the occupations listed on the left. Areas may be used more than once.

   _____a. Quality control supervisor

   _____b. Farm operator

   _____c. Area extension director

   _____d. Farm equipment operator

   _____e. Soil conservationist

   _____f. Processed food salesman

   _____g. Custom operator

   _____h. Welder

   _____i. High school teacher

   _____j. Warehouse manager

   _____k. Saw mill operator

   _____l. Agricultural machinery dealer

   _____m. Food inspector

   _____n. Grain elevator employee

   _____o. Florist

   1. Agricultural production
   2. Agricultural supplies
   3. Agricultural mechanics
   4. Agricultural products
   5. Ornamental horticulture
   6. Agricultural resources
   7. Forestry
   8. Agricultural education

5. Number in order the agricultural enterprises by income by placing a "1" in front of the enterprise with the most income, "2" for the next highest income, etc.

   _____a. Fruit and nuts

   _____b. Vegetables

   _____c. Cotton and cottonseed

   _____d. Tobacco

_____e. Meat animals

_____f. Poultry and eggs

_____g. Dairy products

_____h. Feed grains and hay

_____i. Oil bearing crops

_____Food grains

6. Discuss in a short paragraph the economic statistics of the farm industry in the United States.

7. Complete the social security application form and secure a social security number.

CAREERS IN AGRICULTURE
UNIT II

ANSWERS TO TEST

1. a. 3
   b. 4
   c. 5
   d. 1
   e. 2
2. a,b,e,f
3. Any three of the following
   a. Type of work
   b. Working conditions
   c. Training requirements
   d. Possible salaries
   e. Opportunities for advancement
4. a. 4
   b. 1
   c. 8
   d. 3
   e. 6
   f. 4
   g. 2
   h. 3
   i. 8
   j. 4
   k. 7

l. 3

m. 4

n. 2

o. 5

5. a. 8

b. 7

c. 9

d. 10

e. 1

f. 6

g. 4

h. 2

i. 3

j. 5

6. Discussion should include:

a.	Farm population	9,264,000
b.	Number of farms	2,818,580
c.	All farm land (acres)	1,086,375,000
d.	Average acre/farm	385
e.	Value of farm property	$370.1 billion
f.	Net income per farm	$9,789
g.	Farmers average share of retail cost is approximately 40%	

INTRODUCTION TO THE FUTURE FARMERS OF AMERICA
UNIT I

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to discuss the organization and operation of a local chapter and describe the purposes of the organization. The student should also be able to write a brief history and discuss the requirements for membership. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Write a short paragraph describing major events in the history of the Future Farmers of America.
2. List the requirements for membership in the FFA.
3. Select from a list the types of membership in the FFA.
4. Name the official FFA colors.
5. Write the FFA motto.
6. Recite the FFA creed.
7. List the five symbols which make up the FFA emblem and the meaning of each.
8. Select from a list of terms the four degrees of active membership.
9. Name the six main offices of the local chapter and one duty of each.
10. Name the officers of the state association.
11. Identify the symbols of the FFA officers' stations.
12. List four essentials of a good chapter.
13. Select from a list the primary aim of the FFA.
14. List four of the specific purposes of FFA.
15. Name the seven FFA districts in Kansas.

INTRODUCTION TO THE FUTURE FARMERS OF AMERICA
UNIT I

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information sheet
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information sheet
6. Provide students with the official FFA manual
7. Give test

(Note: Instructor may want to secure films on "Four Star Farmers" or "Focus on Forty" to show to class. It may also be helpful to have a former FFA member to talk to the class.)

Student:

1. Read objectives
2. Study information sheet
3. Recite the creed
4. Become an active member in local chapter
5. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheet
3. Transparency master
    TM 1--Symbols of the Officers' Stations
4. Test
5. Answers to test

References:

1. Vocational Agriculture and the FFA. The Future Farmers of America in cooperation with the Agricultural Education Branch of the Office of Education, Department of Health, Education, and Welfare, Washington, D.C.

2. Official Manual. Alexandria, Virginia: Future Farmers of America, 1973.

3. The Future Farmers of America Organization, What It Is, What It Does. The Future Farmers of America Foundation, Inc., in cooperation with the Division of Vocational and Technical Education, U.S. Office of Education, Washington, D.C.

4. Selland, Larry and Dennis Torrence. Advisors Teaching Guide on the FFA. FFA Fellows, University of Maryland, 1968-1969.

INTRODUCTION TO THE FUTURE FARMERS OF AMERICA
UNIT I

INFORMATION SHEET

I. Brief history of the FFA

  A. Organized nationally in 1928 at Kansas City, Missouri

  B. Kansas--the 16th state chartered; chartered in 1929

  C. National convention held each fall at Kansas city, Missouri during the time of the American Royal

  D. Kansas Association FFA State Convention--held each spring at Kansas State University

  E. State advisor--Mr. Les Olsen

  F. State executive secretary--Dr. Dan Marrs

  G. 500,385 members in 7,838 chapters throughout 50 states and Puerto Rico

  H. 6,886 members in 152 Kansas chapters

  I. Admitted girls into the organization in 1969

  J. Official song--"Hail the FFA"

  K. Seven FFA districts in Kansas--Southeast, East Central, Northeast, North Central, Northwest, South Central, Southwest

  L. State FFA Leadership Camp--held during July at Rock Springs Ranch near Junction City

II. Requirement for membership

  A. 14-21 years of age

  B. Enrolled in vocational agriculture

  C. Be in good standing with local chapter

  D. (Local requirements)

III. Types of membership in the FFA

  A. Active

  B. Honorary

  C. Alumni

  D. Collegiate

IV. Official FFA colors--National blue and corn gold

INFORMATION SHEET

V. FFA motto

Learning to do, Doing to learn
Earning to live, Living to serve

VI. The FFA Creed

I believe in the future of farming, with a faith born not of words but of deeds--achievements won by the present and past generations of agriculturists; in the promise of better days through better ways, even as the better things we now enjoy have come to us from the struggles of former years.

I believe that to live and work on a good farm, or to be engaged in other agricultural pursuit, is pleasant as well as challenging; for I know the joys and discomforts of agricultural life and hold an inborn fondness for those associations which, even in hours of discouragement, I cannot deny.

I believe in leadership from ourselves and respect from others. I believe in my own ability to work efficiently and think clearly, with such knowledge and skill as I can secure, and in the ability of progressive agriculturists to serve our own and the public interest in producing and marketing the product of our toil.

I believe in less dependence on begging and more power in bargaining; in the life abundant and enough honest wealth to help make it so--for others as well as myself; in less need for charity and more of it when needed; in being happy myself and playing square with those whose happiness depends upon me.

I believe that rural America can and will hold ture to the best traditions of our national life and that I can exert an influence in my home and community which will stand solid for my part in that inspiring task.

The creed was written by E. M. Tiffany, and adopted at the 3rd National Convention of the FFA. Revised at the 38th Convention.

VII. Symbols of the FFA emblem

A. Owl--Symbolic of wisdom and knowledge

B. Plow--Symbolic of labor and tillage of the soil

C. Rising Sun--Symbolic of a new day (era) in agriculture

D. Cross-section of the ear of corn--Symbolic of common agricultural interests

E. American Eagle--Symbolic of the national scope of the organization

VIII. Degrees of active membership

A. Greenhand

B. Chapter Farmer

INFORMATION SHEET

C. State Farmer

D. American Farmer

IX. Offices of the local chapter and duties

(NOTE: Every chapter should at least have the first seven offices.)

A. President--Presides over all meetings

B. Vice-President--Assists president and directs all committee work

C. Secretary--Keeps minutes of all meetings

D. Treasurer--Keeps financial records

E. Reporter--Reports chapter news

F. Advisor--Advises FFA members on all metters relating to the chapter

G. Sentinel--Assists president in maintaining order

H. Historian--Keeps chapter scrapbook

I. Chaplin--Takes charge of religious exercises during meetings, banquets, or other occasions

J. Parliamentarian--Informs the members on correct parliamentary procedure

X. State FFA officers (to be completed by teacher)

A. President--

B. Vice-President--

C. Secretary--

D. Treasurer--

E. Reporter--

F. Sentinel--

G. Advisor--

H. Executive Secretary

XI. Symbols of FFA officers' stations (Transparency 1)

A. Rising sun--President

B. Plow--Vice-President

C. Ear of corn--Secretary

INFORMATION SHEET

- D. Bust of Washington--Treasurer
- E. American Flag--Reporter
- F. Shield of Friendship--Sentinel
- G. Owl--Advisor

XII. Essentials of a good chapter

- A. Knowledge of the FFA on the part of every member
- B. Capable officers and leaders
- C. Responsibilities shared by all members in chapter activities
- D. A challenging program of activities
- E. Adequate financing for chapter activities
- F. Proper paraphernalia, equipment and records
- G. Well planned, regularly held chapter meetings
- H. Support by school officials and community leaders

XIII. Primary aim of FFA--Development of agricultural leadership, cooperation, and citizenship

XIV. Specific purposes of FFA

- A. To develop competent, aggressive, rural, and agricultural leadership
- B. To create and nurture a love of country life
- C. To strengthen the confidence of students of vocational agriculture in themselves and their work
- D. To create more interest in the intelligent choice of agricultural occupations
- E. To encourage members to improve the farm home and its surroundings
- F. To encourage members in the development of individual farming programs and establishment in agricultural careers
- G. To participate in worthy undertakings for the improvement of agriculture
- H. To develop character, train for useful citizenship, and foster patriotism

INFORMATION SHEET

I. To participate in cooperative effort

J. To encourage and practice thrift

K. To encourage improvement in scholarship

L. To provide and encourage the development of organized rural recreational activities

XV. Dues (completed by the instructor)

A. National--$______________

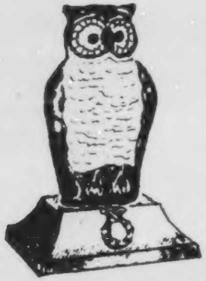
B. State-- $______________

C. District--$______________

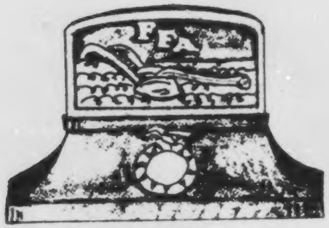
D. Local-- $______________

(NOTE: National dues include subscription to the National Future Farmer Magazine and State dues include a subscription to the Kansas Future Farmer Magazine.)

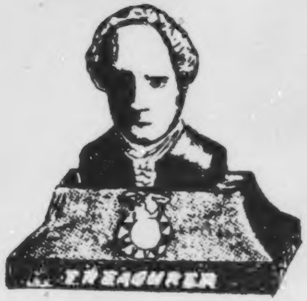
Symbols of Officers' Stations



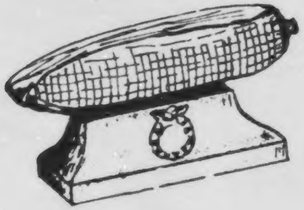
Advisor



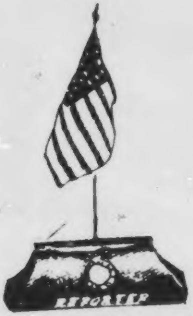
Vice-President



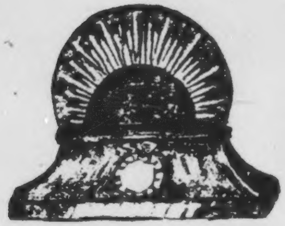
Treasurer



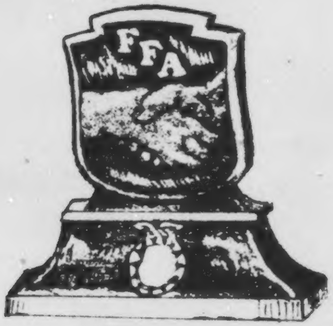
Secretary



Reporter



President



Sentinel

INTRODUCTION TO THE FUTURE FARMERS OF AMERICA
UNIT I

TEST

1. Write a short paragraph describing major events in the history of the Future Farmers of America.

2. List the requirements for membership in the FFA.

   a.

   b.

   c.

   d.

3. Select from the list below the types of membership in the FFA by placing an "X" in the correct blanks.

   _____a. Active

   _____b. Associate

   _____c. Collegiate

   _____d. Inactive

   _____e. Honorary

   _____f. Regular

   _____g. Chapter Farmer

   _____h. Alumni

4. The official FFA colors are ______________________ and ________________.

5. Write the FFA motto.

6. Recite the FFA creed.

(NOTE: If this activity has not been accomplished prior to the test, ask the instructor when it should be completed.)

7. List the five symbols which make up the FFA emblem and the meaning of each.

a.

b.

c.

d.

e.

8. Select from a list of terms below the four degrees of active membership by placing an "X" in the correct blanks.

_____a. Honorary

_____b. Chapter Farmer

_____c. Alumni

_____d. Associate

_____e. Greenhand

_____f. American Farmer

_____g. Regular farmer

_____h. State Farmer

9. Name the seven main officers of the local chapter and one duty of each.

a.

b.

c.

d.

e.

f.

g.

10. Name the following officers of the state association.

  a. President--

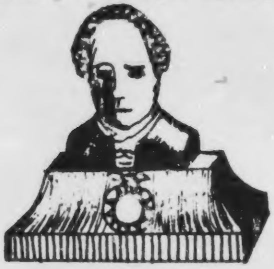
  b. Secretary--

  c. Advisor--

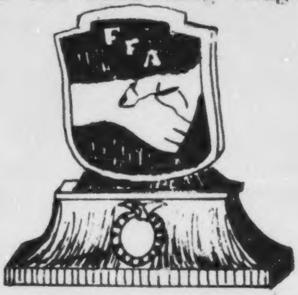
  d. Reporter--

  e. Executive Secretary--

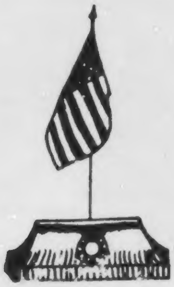
11. Identify the FFA officers' symbols from the following diagrams.



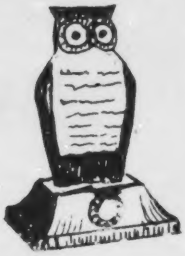
a.______________________



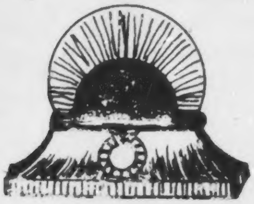
b.______________________



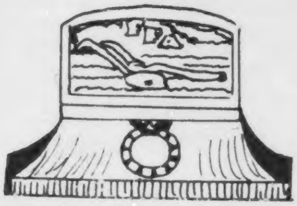
c.______________________



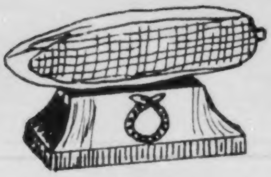
d.______________________



e.______________________



f.______________________



g. ____________________

12. List four essentials of a good chapter.

    a.

    b.

    c.

    d.

13. Underline the primary aim of the Future Farmers of America.

    a. The development of leadership

    b. The maturing of the individual

    c. The development of self-confidence

    d. The development of agricultural leadership, cooperation, and citizenship

14. List four of the specific purposes of FFA.

    a.

    b.

    c.

    d.

15. List the seven FFA districts in Kansas.

    a.

    b.

    c.

    d.

    e.

    f.

    g.

INTRODUCTION TO THE FUTURE FARMERS OF AMERICA
UNIT I

ANSWERS TO TEST

1. Description should include most of the following

    a. Organized nationally in 1928 at Kansas City, Missouri

    b. Kansas has number 16 charter

    c. National convention held at Kansas City in the fall annually at the time of the American Royal

    d. Kansas State convention held in spring at Kansas State University

    e. Mr. Les Olsen--State advisor

    f. Dr. Dan Marrs--State executive secretary

    g. 500,385 members in 7,838 chapters throughout 50 states and Puerto Rico

    h. 6,886 members in 152 chapters in Kansas

    i. Admitted girls into the FFA in 1969

    j. Official song--"Hail the FFA"

2. a. 14-21 years of age

    b. Enrolled in vocational agriculture

    c. Be in good standing with local chapter

    d. (Local requirements)

3. a,c,e,h

4. National blue, corn gold

5. Learning to do, Doing to learn
   Earning to live, Living to serve

6. This should be completed before test time. Evaluated to the satisfaction of the instructor

7. a. Owl--Symbolic of knowledge and wisdom

    b. Plow--Symbolic of labor and tillage of soil

    c. Rising sun--Symbolic of a new day (era) in agriculture

   d. Cross section of ear of corn--Symbolic of common agricultural interests

   e. American Eagle--Symbolic of the national scope of the organization

8. b, e, f, h

9. a. President--Presides over all meetings

   b. Vice President--Assists president and directs all committee work

   c. Secretary--Keeps minutes of all meetings

   d. Treasurer--Keeps financial records

   e. Reporter--Reports chapter news

   f. Sentinel--Assists president in maintaining order

   g. Advisor--Advises FFA members on all matters relating to the chapter

10. (To be completed by instructor each year)

   a. President--

   b. Secretary--

   c. Advisor--

   d. Reporter--

   e. Executive Secretary--

11. a. Treasurer

   b. Sentinel

   c. Reporter

   d. Advisor

   e. President

   f. Vice-President

   g. Secretary

12. Any four of the following

   a. Knowledge of the FFA on the part of every member

   b. Capable officers and leaders

- c. Responsibilities shared by all members in chapter activities
- d. Challenging program of activities
- e. Adequate financing for chapter activities
- f. Proper paraphernalia, equipment, and records
- g. Well planned, regularly held chapter meetings
- h. Support by school officials and community leaders

13. d

14. Any four of the following
    - a. To develop competent, aggressive, rural, and agricultural leadership
    - b. To create and nurture a love of country life
    - c. To strengthen the confidence of students of vocational agriculture in themselves and their work
    - d. To create more interest in the intelligent choice of agricultural occupations
    - e. To encourage members to improve the farm home and its surroundings
    - f. To encourage members in the development of individual farming programs and establishment in agricultural careers
    - g. To participate in worthy undertakings for the improvement of agriculture
    - h. To develop character, train for useful citizenship, and foster patriotism
    - i. To participate in cooperative effort
    - j. To encourage and practice thrift
    - k. To encourage improvement in scholarship
    - l. To provide and encourage the development of organized rural recreational activities

15. a. Northeast
    - b. North Central
    - c. East Central
    - d. Southeast
    - e. South Central
    - f. Southwest
    - g. Northwest

DUTIES AND RESPONSIBILITIES OF FFA MEMBERS
UNIT II

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to discuss the duties and responsibilities of being an FFA member. He should be able to organize the order of business for a meeting and discuss the areas of the program of activities. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. List the order of business for a FFA meeting.
2. List six items that constitute a good FFA meeting.
3. Identify the location of the FFA officers' stations during a FFA meeting when given a diagram of the meeting room.
4. List five areas in the program of activities.
5. List the purposes for which committees are formed.
6. Discuss in a paragraph the proper use of the FFA jacket or blazer.
7. List six items in the code of ethics.
8. List five leadership activities that would apply to the FFA chapter and community.
9. List three purposes of the Future Farmer Supply Service as related to the local chapter.
10. Describe two activities in which a local chapter can participate or sponsor during national FFA week.
11. Complete checklist on successful chapter operation.

DUTIES AND RESPONSIBILITIES OF FFA MEMBERS
UNIT II

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objectives
2. Provide students with information and assignment sheets
3. Make transparency
4. Discuss terminal and specific objectives
5. Discuss information sheet
6. Discuss assignment sheet. Have each student complete the assignment sheet before discussing it with the class and officers.
7. Give test

Students:

1. Read objectives
2. Study information sheet
3. Complete assignment sheet
4. Become actively involved in the local chapter's activities
5. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objective sheets
2. Information sheet
3. Transparency master
    TM 1--Room Arrangement for FFA Meeting
4. Assignment Sheet
    #1--Checklist on Successful Chapter Operations
5. Test
6. Answer to test

References:

1. Official Manual. Alexander, Virginia: Future Farmers of America, 1973.

2. Gray, Farrell D. and J.R. Jackson. Leadership Training and Parliamentary Procedure for FFA. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1958.

DUTIES AND RESPONSIBILITIES OF FFA MEMBERS
UNIT II

INFORMATION SHEET

I. Order of business for FFA meetings

   A. Opening ceremony

   B. Minutes of the previous meeting

   C. Orders of the day

   D. Officers' reports

   E. Reports on chapter program of activities

   F. Special features

   G. Unfinished business

   H. Committees' reports

      1. Standing

      2. Special

   I. New business

   J. Degree and installation ceremonies

   (NOTE: Used only when new members are initiated, when Greenhands are raised to the Chapter Farmer degree, or when officers are installed.)

   K. Closing ceremony

   L. Entertainment, recreation, refreshments

II. Items that constitute a good FFA meeting

   A. Effective use of an executive committee to assure careful planning in advance of the meeting time

   B. Starts and closes on time

   C. Proceeds according to an established order of business

   D. Conducted according to accepted parliamentary procedure

   E. Includes well-prepared committees', secretary's and treasurer's reports

INFORMATION SHEET

F. Shows that each officer is familiar with his or her duties and responsibilities

G. Commands the interest and attention of all members

H. Provides for maximum member participation and develops the cooperative attitude

I. Includes business, entertainment features, and refreshments

J. Moves along with "snap" thus preventing monotony and the wasting of time

K. Proceeds with a minimum of active participation by the Advisor

III. Location of FFA officers' stations in the meeting room (Transparency 1)

IV. Areas covered in program of activities

A. Supervised agricultural occupations experience

B. Cooperation

C. Community service

D. Leadership

E. Earnings, savings, and investments

F. Conduct of meetings

G. Scholarship

H. Recreation

I. Public relations

J. State and national activities

K. Alumni Relations

(NOTE: Chapter executive committee should appoint each person to a committee on the program of activities.)

V. Purposes for which committees are formed

A. To reach chapter goals

1. Superior chapter award

2. Gold emblem chapter award

INFORMATION SHEET

3. National chapter award
    a. Bronze emblem chapter
    b. Silver emblem chapter
    c. Gold emblem chapter

B. To accomplish specific work assignments

C. To deal with specific problems

D. To research and make recommendations about new areas of interest

VI. Proper wear of FFA jacket or blazer

A. The jacket or blazer should only be worn by persons who are members of the organization

B. It should be kept clean and neat at all times

C. The jacket should have only a large emblem on the back and a small emblem on the front; the name of the State Association and the name of the local chapter on the back; and the name of the individual and one office or honor on the front

D. For the most attractive appearance, the jacket should be worn on official occasions with the zipper fastened to the top. The collar should be turned down and cuffs in place and buttoned

E. The jacket or blazer should be worn by officers and members on all official FFA occasions, as well as other occasions where the chapter is represented. It may be worn to school and other appropriate places

F. The jacket or blazer should only be worn to places that are appropriate for members to visit

G. The jacket should be worn by contestants in the National Public Speaking Contest, and at other occasions when FFA members are receiving FFA awards

H. School letters and insignia of other organizations should not be attached to or worn on the jacket

I. The jacket or blazer should not be worn with garments bearing the insignia of other organizations

J. When the jacket becomes too faded and worn to wear in public, it should be discarded or the emblems and lettering should be removed

INFORMATION SHEET

K. The emblems and lettering should be removed if the jacket or blazer is given or sold to a non-member

L. A member always acts like a lady or gentleman when wearing the jacket or blazer

M. Members should refrain from smoking while wearing the FFA jacket or blazer of when officially representing the organization

N. All chapter degree, officer, and award medals should be worn beneath the name on the right side of the jacket, with the exception that a single State Farmer charm and American Farmer key should be worn above the name or attached to a standard key chain. No more than three medals should be worn on the jacket; these should represent the highest degree earned, the highest office held, and highest award earned by the member

VII. Code of ethics for FFA members

A. Dress neatly and appropriately for the occasion

B. Show respect for the rights of others and be courteous at all times

C. Be honest and do not take unfair advantage of others

D. Respect property of others

E. Refrain from loud, boisterous talk, swearing, and horseplay

F. Demonstrate sportsmanship in the show ring, judging contests, and meetings

G. Attend meetings promptly and respect the opinions of others in discussion

H. Take pride in the FFA organization, activities, farming programs, exhibits, and in the occupation of farming and ranching

I. Share with others experiences and knowledge gained by attending national and state meetings

VIII. Leadership activities

A. Provide special training for newly elected officers

B. Elect auxiliary officers

C. Conduct chapter public speaking contest

D. Provide experience in parliamentary procedure

E. Provide experience in conducting meetings

INFORMATION SHEET

F. Participate in a chapter leadership training school

G. Send members to state and district conventions and/or activities

H. Encourage sending president to FFA National Leadership Conference

I. Provide committee work

(NOTE: Each member should be assigned to a standing committee.)

J. Assist members to apply for the higher degrees

K. Encourage participation in school activities that involve leadership

L. Encourage participation in community activities

IX. Purposes of Future Farmer Supply Service

A. Supplies all official FFA merchandise

B. Insures uniformity in official FFA merchandise

C. Provides high-quality official merchandise

X. National FFA Week activities

A. Radio and TV programs

B. FFA Week articles in newspapers

C. School assembly

D. Civic club program

E. Parent and son banquet

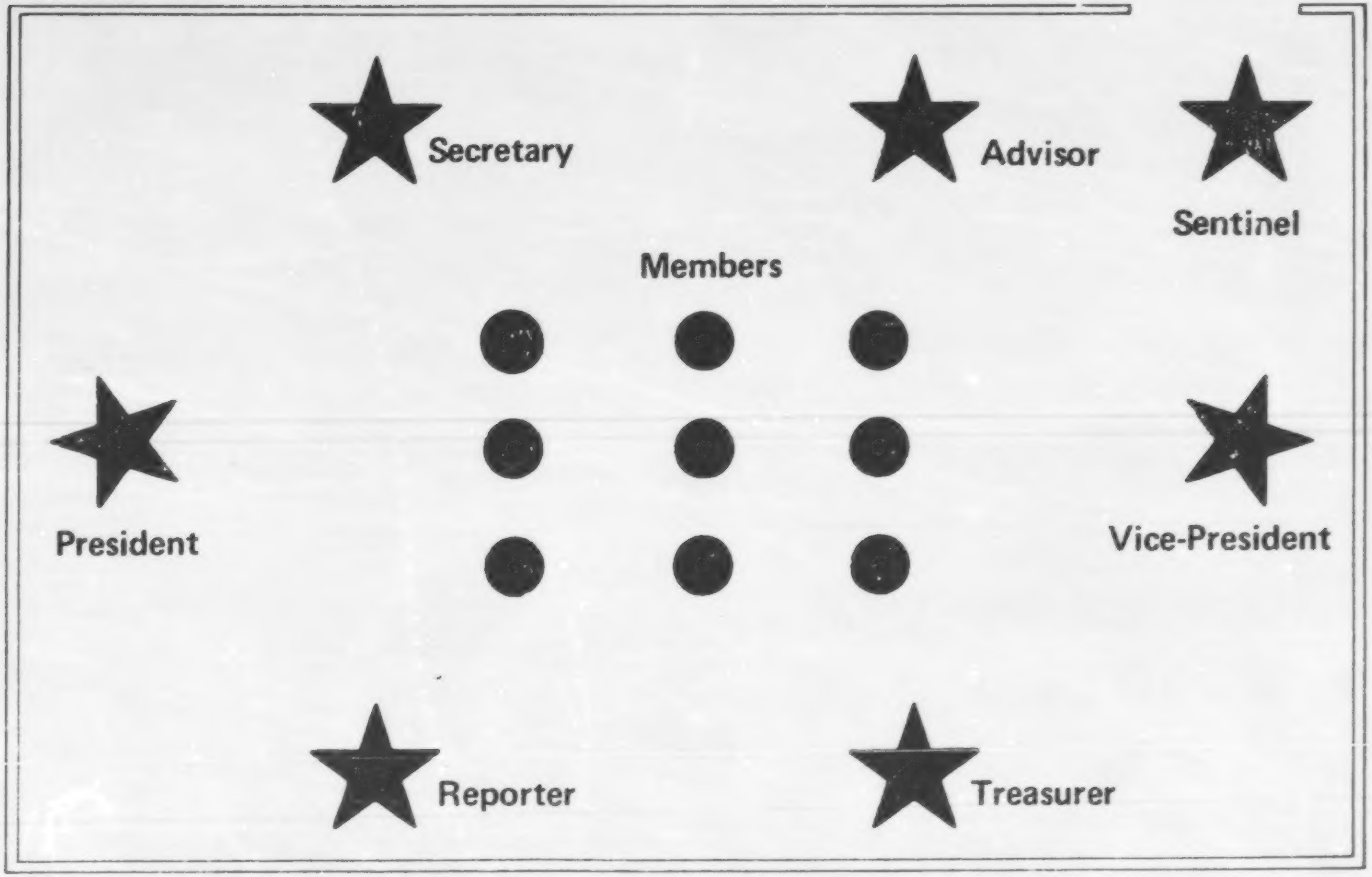
F. Posters displayed around town

G. Attend church as a group

H. Window displays

I. Others that the chapter approves

Room Arrangement for FFA Meeting


Secretary
Advisor
Sentinel
Members
President
Vice-President
Reporter
Treasurer

TM 1

Ag. I - 35-B

DUTIES AND RESPONSIBILITIES OF FFA MEMBERS
UNIT II

ASSIGNMENT SHEET #1--CHECKLIST ON SUCCESSFUL CHAPTER OPERATIONS

Each member should complete the checklist evaluating chapter cooperation. Answer each question yes or no.

_____1. Are the officers selected through a nominating committee on the basis of special qualifications?_______Do they meet frequently to plan work and receive assistance?

_____2. Are school authorities and others concerned consulted and kept informed on the activities of the chapter?

_____3. Does the chapter have a written program of activities formulated by the members?_____Was last year's program completed?

_____4. Is there a committee functioning on each division of the present program of activities?

_____5. Does the chapter have a written budget based primarily on the program of activities and a sound plan developed for securing the necessary funds with which to operate?

_____6. Is the expenditure of chapter funds properly safeguarded?

_____7. Do a high percentage of members get experience in the work of the chapter and do they have definite responsibilities that contribute to its success or failure?

_____8. Does the chapter possess the standard meeting equipment and is it properly mounted and protected?

_____9. Has a satisfactory system of chapter records and reports been developed?

____10. Is at least one planned meeting held each month when sufficient time is available to take care of all chapter business?_____ Is the program for each chapter meeting posted in advance? _______Is accepted parliamentary procedure followed?

____11. Does the chapter name an executive committee with power to act for the chapter when necessary?

____12. Do all of the students enrolled in vocational agriculture belong to the chapter? Are qualified members advanced systematically to higher degrees of membership?

____13. Does the chapter have over ninety percent of its members in attendance at regular meetings?

____14. Do a high percentage of members know what they should about FFA?______Is systematic, continuous leadership training given to all members starting with them as Greenhands?

DUTIES AND RESPONSIBILITIES OF FFA MEMBERS
UNIT II

TEST

1. List the order of business for a FFA meeting.

   a.

   b.

   c.

   d.

   e.

   f.

   g.

   h.

   i.

   j.

   k.

   l.

2. List six items that constitute a good FFA meeting.

   a.

   b.

   c.

   d.

   e.

   f.

3. Identify the location of the FFA officers' stations for a FFA meeting by stating the correct office in the blanks provided.

   a.______________________________

   b.______________________________

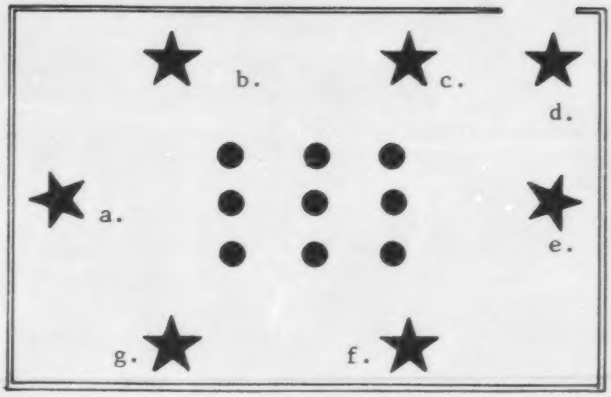
   c.______________________________

d. ______________________________

e. ______________________________

f. ______________________________

g. ______________________________



4. List five areas of the program of activities.

a.

b.

c.

d.

e.

5. List the purposes for which committees are formed.

a.

b.

c.

d.

6. Discuss in a short paragraph the proper use of the FFA jacket or blazer.

7. List six items in the code of ethics.

   a.

   b.

   c.

   d.

   e.

   f.

8. List five leadership activities that would apply to the FFA chapter and community.

   a.

   b.

   c.

   d.

   e.

9. List three purposes of the Future Farmers Supply Service as related to the local chapter.

   a.

   b.

   c.

10. Describe briefly two activities that a local chapter can participate or sponsor during National FFA Week.

a.

b.

11. Complete checklist on successful chapter operation

(NOTE: If this has not been accomplished prior to the test, ask the instructor when the above activity should be completed.)

DUTIES AND RESPONSIBILITIES OF FFA MEMBERS
UNIT II

ANSWERS TO TEST

1. a. Opening ceremony
   b. Minutes of previous meeting
   c. Orders of the day
   d. Officers' reports
   e. Reports on chapter program of activities
   f. Special features
   g. Unfinished business
   h. Committees' reports
   i. New business
   j. Degree and installation ceremonies
   k. Closing ceremony
   l. Entertainment, recreation, refreshments

2. Any six of the following
   a. Effective use of an executive committee to assure careful planning in advance of the meeting time
   b. Starts and closes on time
   c. Proceeds according to an established order of business
   d. Conducted according to accepted parliamentary procedure
   e. Includes well-prepared committees', secretary's, and treasurer's reports
   f. Shows that each officer is familiar with his or her duties and responsibilities
   g. Commands the interest and attention of all members
   h. Provides for maximum member participation and develops the cooperative attitude
   i. Includes business, entertainment features, and refreshments

j. Moves along with "snap" thus preventing monotony and the wasting of time

k. Proceeds with a minimum of active participation by the Advisor

3. a. President

b. Secretary

c. Advisor

d. Sentinel

e. Vice-President

f. Treasurer

g. Reporter

4. Any five of the following

a. Supervised agricultural occupations experience

b. Cooperation

c. Community service

d. Leadership

e. Earnings, savings, and investments

f. Conduct of meetings

g. Scholarship

h. Recreation

i. Public relations

j. State and national activities

k. Alumni relations

5. a. To reach chapter goals

b. To accomplish specific work assignments

c. To deal with specific problems

d. To research and make recommendations about new areas of interest

6. Discussion should include some of the following

a. The jacket or blazer should only be worn by persons who are members of the organization

b. It should be kept clean and neat at all times

- c. The jacket should have only a large emblem on the back and a small emblem on the front; the name of the State Association and the name of the local chapter on the back; and the name of the individual and one office or honor on the front
- d. For the most attractive appearance, the jacket should be worn on official occasions with the zipper fastened to the top. The collar should be turned down and the cuffs in place and buttoned
- e. The jacket or blazer should be worn by officers and members on all official FFA occasions, as well as other occasions where the chapter is represented. It may be worn to school and other appropriate places
- f. The jacket or blazer should only be worn to places that are appropriate the members to visit
- g. The jacket should be worn by contestants in the National Public Speaking Contest, and at other occasions when FFA members are receiving FFA awards
- h. School letters and insignia of other organizations should not be attached to or worn on the jacket
- i. The jacket or blazer should not be worn with garments bearing the insignia of other organizations
- j. When the jacket becomes too faded and worn to wear in public, it should be discarded or the emblems and lettering should be removed
- k. The emblems and lettering should be removed if the jacket or blazer is given or sold to a non-member
- l. A member always acts like a lady or gentleman when wearing the jacket or blazer
- m. Members should refrain from smoking while wearing the FFA jacket or blazer or officially representing the organization
- n. All chapter degree, officer, and award medals should be worn beneath the name on the right side of the jacket, with the exception that a single State Farmer charm and American Farmer key should be worn above the name or attached to a standard key chain. No more than three medals should be worn on the jacket; these should represent the highest degree earned, the highest office held, and the highest award earned by the member

7. Any six of the following
   - a. Dress neatly and appropriately for the occasion
   - b. Show respect for the rights of others and be courteous at all times
   - c. Be honest and do not take unfair advantage of others

   d. Respect property of others

   e. Refrain from loud, boisterous talk, swearing, and horseplay

   f. Demonstrate sportsmanship in the show ring, judging contests, and meetings

   g. Attend meetings promptly and respect the opinions of others in discussion

   h. Take pride in the FFA organization, activities, farming programs, exhibits, and in the occupation of farming and ranching

   i. Share with others experiences and knowledge gained by attending national and state meetings

8. Any five of the following

   a. Provide special training for newly elected officers

   b. Elect auxiliary officers

   c. Conduct chapter public speaking contest

   d. Provide experience in parliamentary procedure

   e. Provide experience in conducting meetings

   f. Participate in a chapter leadership training school

   g. Send members to state and district conventions and/or activities

   h. Encourage sending president to FFA National Leadership Conference

   i. Provide committee work

   j. Assist members to apply for the higher degrees

   k. Encourage participation in school activities that involve leadership

   l. Encourage participation in community activities

9. a. Supplies all official FFA merchandise

   b. Insures uniformity in official FFA merchandise

   c. Provides high-quality official merchandise

10. Description should include any two of the following

   a. Radio and TV programs

   b. FFA Week articles in newspapers

   c. School assembly
   d. Civic club program
   e. Parent and son banquet
   f. Posters displayed around town
   g. Attend church as a group
   h. Window displays
   i. Others that the chapter approves

11. Evaluated to the satisfaction of the instructor.

PARLIAMENTARY PROCEDURE AND PUBLIC SPEAKING
UNIT III

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to apply correct parliamentary procedure in a meeting situation for all offices and as a member. He should also be able to write and deliver a speech over a topic of his choice. This knowledge and skills will be evidenced through actual demonstration and by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. List two principles upon which parliamentary procedure is based.
2. Select from a list three characteristics of a good chairman.
3. Match types of motions with the appropriate definition.
4. Write the characteristics of the kinds of motions used in conducting a meeting.
5. List three purposes for making a speech.
6. Write the outline that most speeches follow.
7. List the three "ups" of speech delivery.
8. List three different speech contests in which FFA members may participate.
9. Demonstrate the ability to:
    a. Use parliamentary procedure correctly.
    b. Write and deliver a speech two to three minutes in length.

PARLIAMENTARY PROCEDURE AND PUBLIC SPEAKING
UNIT III

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information sheet
3. Discuss terminal and specific objectives
4. Have student conduct a business meeting using correct parliamentary procedure
5. Have students give speeches
6. Give test

Student:

1. Read objective sheet
2. Study information sheet
3. Participate in discussion in business meetings and serve as chairman at least once
4. Write and deliver a speech
5. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objective sheet
2. Information sheet
3. Transparency masters
    - TM 1--Parliamentary Procedure Scorecard (two pages)
    - TM 2--Public Speaking Score Sheet
4. Test
5. Answers to test

References:

1. Jones, O. Gargiels. Parliamentary Procedure at a Glance. New York: Meredith Press, 1949.

2. Stewart, Wilbur F. Helps in Mastering Parliamentary Procedure. New Concord, Ohio: Co-op Printship, 1954.

3. Jones, O. Garfield. Senior Manual for Group Leadership. New York: Appleton-Century-Crofts, Inc., 1949.

4. Sturgis, Alice F. Parliamentary Procedure. New York: McGraw-Hill Book Co., Inc.

5. Cruzen, R.M. Practical Parliamentary Procedure. Bloomington, Illinois: McKnight and McKnight, 1954.

6. Sutherland, S. S. When You Preside. Danville, Illinois: Interstate Printers and Publishers, 1959.

7. Russell, K.E. A Handbook for Conducting FFA Meetings. Danville, Illinois: McKnight and McKnight, 1954.

8. FFA Official Manual. Alexandria, Virginia: Future Farmers Supply Service, 1974.

9. Carnegie, Dale. Public Speaking and Influencing Men in Business. Association Press, 1961.

10. Judson, Lyman S. Public Speaking for Future Farmers. Danville, Illinois: Interstate Printers and Publishers, 1957.

11. Leadership of Youth Groups: Communications Skills. Kansas City, Missouri: Farmland Industries, 1967.

12. Ross, Robert W. Oral Presentation and Visual Aids. Washington, D.C.: R. W. Ross Associates.

13. Gray, Jarrell D. and J. R. Jackson. Leadership Training and Parliamentary Procedure for FFA. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1958.

14. Purkey, R. D. Handbook on Speech for FFA. Danville, Illinois: Interstate Printers and Publishers, 1958.

15. Kansas FFA Activities and Awards Opportunities 1976-77, State Department of Education, Agriculture Education, Topeka, Kansas.

16. Henderson, Melvin and Rucker, Herbert J. A Guide to Parliamentary Practices. Danville, Illinois: Interstate Printers and Publishers.

PARLIAMENTARY PROCEDURE AND PUBLIC SPEAKING
UNIT III

INFORMATION SHEET

I. Principles upon which parliamentary procedure is based

  A. The right of the majority to rule

  B. The right of the minority to be heard and protected

II. Characteristics of a good chairman

  A. Be impartial

  B. Inspire confidence in the members

  C. Provide leadership

III. Types of motions (Transparency 1)

  A. Main motion

    1. Main idea before the meeting

    2. Only one main motion before the meeting

  B. Privileged Motion

    1. Does not relate to pending questions

    2. Has priority overall other motions, so must be acted upon at once

  C. Subsidiary Motion

    1. Motion applied to a pending motion to help dispose of that motion

    2. Must be decided before continuing with the pending question

  D. Incidental Motion

    1. Arise out of a pending motion

    2. Must be decided before continuing with pending question

IV. Table of motions and rules that apply to motions

V. Purposes for making a speech

  A. To inform

  B. To entertain

  C. To persuade

INFORMATION SHEET

VI. Speech outline

- A. Introduction
- B. Discussion
- C. Conclusion

VII. Three "ups" of speech delivery

- A. Stand up (avoid leaning on podium)
- B. Speak up
- C. Shut up (short conclusion)

VIII. FFA Speeches

- A. Public Speaking
    - 1. Senior Division
        - a. To qualify for State and National competition speech topic must be
            - 1) of an agricultural character (nature) and of general interest to the public
            - 2) a minimum of six minutes long and a maximum of eight long

(NOTE: There are some variations in district speech contest. The scorecard included is the National FFA Speech scorecard which is used in the state contest. Transparency 2)

-
    -
        - b. An additional five minutes will be allowed for questions relating to the speech
    - 2. Junior, Sophomore, Freshman divisions
        - a. District level contests
        - b. Rules vary among districts
- B. Extemporaneous Speaking
    - 1. Contestant is given 20 minutes to prepare a 3-5 minute speech from a list of topics
    - 2. Rules may vary among districts
    - 3. State competition held during the State High School Agricultural and Agricultural Mechanics contests in Manhattan

C. Greenhand Creed Speaking

1. Contestant delivers creed from memory
2. Contestant answers questions from judges
3. Rules may slightly vary among districts
4. State competition held during the State convention

(NOTE: More information on these contests are found in the last edition of Kansas FFA Activities and Awards Opportunities or by contacting the State Office.)

Official Scorecard - Parliamentary Procedure

Score	Abilities Demonstrated	S	D	A	VOTE	Team Score
	Call to order					
20	Poise and personal appearance of presiding officer and manner displayed (1)					
40	Poise, appearance, and manner displayed by team					
10	Grammar and sentence structure (2)					
20	General effect and the use of realistic measures					
10	Secretary's minutes (used in case of tie)					
20	Effective use of debate					
RANKING MOTIONS (Ranked according to precedence)						
A	PRIVILEGED MOTIONS	S	D	A	VOTE	
10	To fix time to adjourn (4)	Y	N	(7)	M	
10	To adjourn (5)	Y	N	N	M	
10	To take a recess (6)	Y	N	(7)	M	
10	To raise a question or privilege	N	N	N	(8)	
10	To pass the gavel	N	N	N		
B	SUBSIDIARY MOTIONS					
10	To lay on the table	Y	N	N	M	
10	To call for the previous question	Y	N	N	2/3	
10	To limit or extend time of debate	Y	N	(7)	2/3	
10	To postpone definitely (to certain time)	Y	Y	Y	M	
10	To commit or refer	Y	Y	Y	M	
10	To amend proposed amendment	Y	(9)	N	M	
10	To amend	Y	(9)	Y	M	
10	To postpone indefinitely	Y	Y	N	M	
C	MAIN MOTIONS					
30	Main motion (to introduce business)	Y	Y	Y	M	
NON-RANKING MOTIONS						
A	INCIDENTAL MOTIONS					
10	To raise a point of order	N	N	N	(10)	
10	To appeal from the decision of chair	Y	(11)	N	M	
10	To suspend the rules	Y	N	N	2/3	
10	To divide the question	(12)	N	Y	M	
10	To call for a division of house	N	N	N	(13)	
10	To rise to a parliamentary inquiry	N	N	N	N	
10	To rise to request information	N	N	N	N	
10	To withdraw a motion	N	N	N	N	
10	To provide manner of voting	Y	N	Y	Y	
B	UNCLASSIFIED MOTIONS					
10	To take from the table	Y	N	N	M	
10	To reconsider	Y	(14)	N	M	
30	Debate (5 points each for 6 times debate is used)					
20	Response to judge's questioning (state contest only)					
120	Parliamentary procedure quiz (20 questions)					
560	FINAL SCORE					

"D"--DEBATABLE; "A"--AMENDABLE; "M"--MAJORITY VOTE;
"Y"--Yes; "N"--NO

NOTES Pertaining to Specific Items on Official Scorecard

(1) Also includes proper use of gavel.
(2) Means correct English, clear, concise, direct, and well-phrased.
(3) Omit.
(4) Is a privileged motion only if made while another motion is pending, and in an assembly that has made no provision for meeting on the same or next day; otherwise, it is a main motion. The answers apply to the privileged motion.
(5) When unqualified, is always a privileged motion except when effect would be to disband the group permanently. The answers apply to the privileged motion, not to motion to adjourn.
(6) Is a privileged motion if made when other business is pending; otherwise, is a main motion. Answers apply to the privileged motion.
(7) Can be amended as to time.
(8) Is usually disposed by chair, without vote.
(9) Can be debated only when the question being amended is debatable.
(10) Is usually decided by chair, without calling for a vote
(11) Cannot be debated if made during a division of the assembly, or when the pending question is undebatable. Cannot be debated when it applies to indecorum, transgression of the rules of speaking, or to priority of business.
(12) The question must be divided at the request of a single member, (which request can be made when another has the floor), provided the resolutions relate to different subjects which are independent of each other.
(13) When a division is called for, the chair proceeds to take the vote again by rising. No vote is taken on whether a division shall be made, i.e., on whether a standing vote shall be taken.
(14) Debatable when the question to be reconsidered is debatable.

(NOTE: The guide used to make the scoresheet was: "Roberts Rules of Order," and "A Guide to Parliamentary Practices" by Melvin Henderson and Herbert J. Rucker of the University of Illinois.)

JUDGES SCORE SHEET STATE PUBLIC SPEAKING CONTEST - FUTURE FARMERS OF AMERICA

Part 1 for Scoring and Composition

Items to be scored	Points Allowed	Points Awarded Contestants 1	2	3	4	5	6	7	8
1. Content of Manuscript Importance and appropriateness of subject Suitability of the material used Accuracy of the Statements included Evidence of purpose Completeness and accuracy of bibliography	200								
2. Composition of Speech - Manuscript Organization of content Unity of thought Logical development Language used Sentence structure Accomplishment of purpose	100								
Part II for Scoring Delivery of the Production:									
Items to be scored	Points Allowed								
1. Voice Pitch Articulation Quality Force Pronunciation	100								
2. Stage Presence Personal appearance Poise and body posture Ease before audience Attitude Confidence Personality	100								
3. Power of Expression Fluency Directness Emphasis Communicative ability Sincerity Conveyance of thought and meaning	200								
4. Response to Questions Ability to satisfactorily answer the questions on the speech which are asked by the judges indicating originality, familiarity with subject, and ability to think quickly	200								
5. General Effect Extent to which the speech was interesting, understandable, convincing, pleasing, and held attention	100								
Total	1,000								
Less time each minute	20								
Grand Totals									
Numerical - or Final placing of contestants									

PARLIAMENTARY PROCEDURE AND PUBLIC SPEAKING
UNIT III

TEST

1. List two principles upon which parliamentary procedure is based.

   a.

   b.

2. List three characteristics of a good chairman.

   a.

   b.

   c.

3. Match the types of motions with the appropriate definition.

_____a. To end meeting	1. Main motion
_____b. To close debate	2. Amendment
_____c. Main idea before the group	3. Adjournment
_____d. To change the main idea	4. To reconsider
_____e. Used when the chair has made an error	5. Point of order

4. Write the characteristics of motions by filling in the blanks in the following table.

	Second Required	Debatable	Vote Required	Amendable
a. Main motion				
b. Amendment				
c. Adjournment				
d. Lay on table				
e. Point of order				

5. List three purposes for making a speech.

   a.

   b.

   c.

6. Write the outline form that most speeches follow.

   a.

   b.

   c.

7. List the three "ups" of speech delivery.

   a.

   b.

   c.

8. List three speech contests in which FFA members may participate.

   a.

   b.

   c.

9. Demonstrate the ability to:

   a. Use parliamentary procedure correctly.

   b. Write and deliver a two to three minute speech.

PARLIAMENTARY PROCEDURE AND PUBLIC SPEAKING
UNIT III

ANSWERS TO TEST

1. a. The right of the majority to rule

b. The right of the minority to be heard and protected

2. a. Be impartial

b. Inspire confidence in the members

c. Provide leadership

3. a. 3

b. 4

c. 1

d. 2

e. 5

4\.

a.	Main motion	Yes	Yes	Yes	Majority
b.	Amendment	Yes	Yes	Yes	Majority
c.	Adjournment	Yes	No	No	Majority
d.	Lay on table	Yes	No	No	Majority
e.	Point of order	No	No	No	None

5. a. To inform

b. To entertain

c. To persuade

6. a. Introduction

b. Discussion

c. Conclusion

7. a. Stand up (avoid leaning on podium)

b. Speak up

c. Shut up (short conclusion)

8. a. FFA Public Speaking
   b. Extemporaneous Speaking
   c. Greenhand Creed Speaking
9. Performance skills will be evaluated to the satisfaction of the instructor.

PLANNING AND IMPLEMENTING THE SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM
UNIT I

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to select a project from the various types available, establish goals for his four years in Vocational Agriculture, and set ways and means for reaching those goals. This knowledge will be evidenced through actual demonstration and by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Describe the four types of supervised occupational experience programs.
2. Distinguish between a supplementary farm skill and an improvement project.
3. List five reasons for having a supervised occupational experience program.
4. List three sources of securing production types projects.
5. Discuss the preparation necessary before securing a production project.
6. Select from a list the requirements for the state farmer degree.

PLANNING AND IMPLEMENTING THE SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM
UNIT I

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objectives
2. Provide students with information and assignment sheets
3. Discuss terminal and specific objectives
4. Discuss the information sheet
5. Give test

Student:

1. Read objectives
2. Study information sheet
3. Complete assignment sheet
4. Select projects
5. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheet
3. Transparency masters
    TM 1--State Farmer Scoresheet (two pages)
4. Test
5. Answers to test

References:

1. Carwin, Merle A. Supervised Occupational Experience Manual. Danville, Illinois: Interstate Printers and Publishers Inc., 1972.

2. Phipps, Lloyd. Handbook on Agricultural Education in Public Schools. Danville, Illinois: Interstate Printers and Publishers Inc., 1972.

PLANNING AND IMPLEMENTING THE SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM
UNIT I

INFORMATION SHEET

I. Types of supervised occupational experience programs

A. Supervised farming program

1. Have production projects

2. Have production occupational objective

3. Should include production and improvement projects

B. Cooperative occupational experience program

1. Have non-production occupational objective

2. Have on-the-job training programs

C. Agricultural occupation training under the laboratory situation

1. Have either production or non-production occupational objective

2. Facilities provided by school

Examples: School farm, greenhouse, shop, or other facilities

D. Farm placement

1. Production or non-production objective

2. Placed in a real life situation for certain length of time for training

(NOTE: Minimum training time is 450 hours.)

II. Supplementary farm skills and improvement projects

A. Improvements projects--An undertaking which involves a series of jobs designed to improve the appearance and real estate value of the farm and/or the efficiency of the farm business as a whole and which contributes to the comfort or conveniences of the farm family

Examples: Home improvement, farm library, beef improvement, or other projects

B. Supplementary farm practice or skills--A farm job for additional experience, skill and/or efficiency not included in the jobs in

INFORMATION SHEET

the student's productive farm enterprise or improvement project

Examples: Welding panels, marketing cattle, loading hogs, or other skills

III. Reasons for having a program

- A. Learn responsibility
- B. Gain experience
- C. Earn money
- D. Develop management abilities
- E. Prepare for a career
- F. Learn record keeping
- G. Learn new skills
- H. Establishment in farming

IV. Sources of projects

- A. Other students in chapter
- B. Farmers or ranchers
- C. Livestock sales
- D. Chapter chain program

V. Preparation for the project

- A. Place for the project
- B. Necessary equipment
- C. Parent, student, teacher conference
- D. Feed
- E. Financing
  - 1. Student
  - 2. Parents
  - 3. Banks

INFORMATION SHEET

4. Farm credit agencies

VI. Requirements for state farmer degree (Transparency 1)

A. Active member of FFA for two years

B. Two years of instruction in Vocational Agriculture

C. Have received the chapter farmer degree

D. Incoming seniors to out-of-school FFA members eligible

E. Outstanding program of supervised farming

F. Have a satisfactory scholastic record

G. Proficiency in parliamentary procedure

H. Give a five minute speech

I. Evidence of leadership and cooperation

J. Earnings of $500 or more from supervised training program or 600 accumulated hours in supervised training

K. Participate in five FFA activities above the chapter level

L. Served as an officer and/or committee chairman, or a participating member of a major committee

M. Participate in the planning and completion of chapter Program of Activities

N. Submission of official FFA record books

O. Application mailing date specified on Kansas FFA calendar

Agribusiness ☐

Production ☐

STATE FARMER EVALUATION SHEET

(This is only a guide)

Candidate No. ______________ Total Points ____________

A. Scholarship -- 10 points (Part I - Agribusiness & Production)
  B or above 10 pt. __________
  C average 5 pt. __________
  D average 0 pt. __________
Total __________

B. Leadership -- 23 points
  1. FFA -- 19 points
    a. FFA officer 2 pt. __________
    b. Leadership School 2 pt. __________
    c. Summer FFA Camp 2 pt. __________
    d. Participation in public speaking (local 1 pt., district 2 pts., or state 3 pts.) 3 pt. __________
    e. Attend State or National Convention 2 pt. __________
    f. Participation in district or state judging schools (land judging, crops, meats, entomology,parliamentary procedure, poultry, livestock, dairy, dairy products-1 point per area with maximum of 4 pts. 4 pt. __________
    g. Other public appearances representing FFA (1 point for each appearance with maximum of 2 points) 2 pt. __________
    h. Co-op activities (from leadership page) 1 pt. __________
    i. Other 1 pt. __________
  2. Other high school -- 2 points
    a. Officer of a class or other school organization 1 pt. __________
    b. Member of other organization (including athletics) 1 pt. __________
  3. Other -- 2 points
    a. Church participation 1 pt. __________
    b. Others 1 pt. __________
Total __________

C. Farm Mechanics -- 10 points
  1. Based on number and variety of skills as well as quantity of production 8 pt. __________
  2. Farm mechanics contest team (district, state) 2 pt. __________
Total __________

D. Improvement and supplementary practices -- 3 points
  1. Improvement practices 2 pt. __________
  2. Supplementary practices 1 pt. __________
Total __________

Part II (Agribusiness Only)

A. Occupational Experience Program -- 34 points
  1. One point per $100 labor income with a maximum of 10 points 10 pt. ________
  2. One point per 50 hours of experience with a maximum of 15 points 15 pt. ________
  3. Add 2 points each time the beginning net worth is doubled with a maximum of 4 points 4 pt. ________
  4. Specific experiences gained 5 pt. ________

Total ________

B. Record Book -- 20 points
  1. Completeness -- 14 points
    a. Plans for getting started 1 pt. ________
    b. Record of where worked 1 pt. ________
    c. Occupational experience plans 1 pt. ________
    d. Improvement projects 1 pt. ________
    e. Agreement 3 pt. ________
    f. Financial records 1 pt. ________
    g. Summary of work and earnings 2 pt. ________
    h. Summary of non-cash earnings 1 pt. ________
    i. Financial statement 1 pt. ________
    j. Leadership and cooperative records 1 pt. ________
    k. Visits and conferences 1 pt. ________
  2. Accuracy -- 6 points
    a. Cash balance (sheet should be enclosed with application; within 1% of cash receipts--3 pts.; 1-5%--2 pts.; 5-10%--1 pt.; over 10%--0 pts.) 3 pt. ________
    b. Accurate throughout 3 pt. ________

Total ________

Part II (Production Only)

A. Farming Program -- 34 points
  1. Gain in net worth -- 16 points
    a. One point per each $100 increase in net worth with a maximum of 12 points 12 pt. ________
    b. Add 2 points each time the beginning net worth is doubled with a maximum of 4 points 4 pt. ________
  2. Productive enterprises (this may include one or more) 18 pt. ________

Total ________

B. Record Book -- 20 points (pages refer to Record Book)
  1. Completeness -- 14 points
    a. Diary, pages 4-5 1 pt. ________
    b. Agreement, page 7 3 pt. ________
    c. Receipts, pages 10-13 1 pt. ________
    d. Expenses, pages 16-25 1 pt. ________
    e. Inventory, pages 26-27 2 pt. ________
    f. Depreciation Schedule, page 26 1 pt. ________
    g. Complete analysis of farming program, pages 31-42 4 pt. ________
    h. Personal expenditures, pages 43-44 1 pt. ________
  2. Accuracy -- 6 points
    a. Cash balance (sheet should be enclosed with application; within 1% of cash receptions--3 pts., 1-5%--2 pts., 5-10%--1 pt., over 10%--0 pts.) 3 pt. ________
    b. Accurate throughout 3 pt. ________

Total ________

PLANNING AND IMPLEMENTING THE SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM
UNIT I

TEST

1. Describe the four types of supervised occupational experience programs

   a.

   b.

   c.

   d.

2. Distinguish between a supplementary farm skill and an improvement project by placing an "X" by the improvement projects and "O" by the supplementary farm skills listed below.

   _____a. Home improvement

   _____b. Fixed corral

   _____c. Swine improvement

   _____d. Load cattle in truck

   _____e. Farm library

   _____f. Hauled cattle to market

   _____g. Beef improvement

   _____h. Groomed beef cattle

   _____i. Pasture improvement

   _____j. Built 1/4 mile fence

3. List five reasons for having a supervised occupational experience program

   a.

   b.

c.

d.

e.

4. List three sources of securing production type projects

a.

b.

c.

5. Discuss the preparation necessary before securing a production project

6. Select from a list the requirements for state farmer by placing an "X" in the blank provided.

_____a. Active member of FFA for two years

_____b. Earn $95 from project program

_____c. Two years of instruction in Vocational Agriculture

_____d. Greenhand for two years

_____e. An incoming senior in school or out-of-school FFA member

_____f. Lead a group discussion for one hour

_____g. Submit official FFA record book

_____h. Application mailed by February 15

PLANNING AND IMPLEMENTING THE SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM
UNIT I

ANSWERS TO TEST

1. Description should include:
    a. Supervised farming program
        1. Have production projects
        2. Have production occupational objective
        3. Should include production and improvement projects
    b. Cooperative occupational experience program (VAOT)
        1. Have non-productive occupational objective
        2. Have on-the-job training programs
    c. Agricultural occupation training under the laboratory situation
        1. Have either production or non-production occupational objective
        2. Facilities provided by school
    d. Farm placement
        1. Production or non-production objective
        2. Placed in a real life situation for certain length of time for training
2. a. X
    b. O
    c. X
    d. O
    e. X
    f. O
    g. X
    h. O

   i. X

   j. O

3. Any five of the following

   a. Learn responsibility

   b. Gain experience

   c. Earn money

   d. Develop management abilities

   e. Prepare for career

   f. Learn record keeping

   g. Learn new skills

   h. Establishment in farming

4. Any three of the following

   a. Other students in chapter

   b. Farmers or ranchers

   c. Livestock sales

   d. Chapter chain program

5. Discussion should include:

   a. Place for project

   b. Necessary equipment

   c. Parent, student, teacher conference

   d. Feed

   e. Financing

KEEPING RECORDS FOR THE SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM
UNIT II

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to select an agricultural enterprise(s) from the various types of agricultural enterprises available, establish goals for his four years in Vocational Agriculture, and set means of reaching those goals. The student should be able to apply the fundamentals of beginning record keeping. This knowledge will be evidenced by scoring ninety percent on a post test, the post test consisting of assignment sheets.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Demonstrate ability to fill out the leadership page in the record book.
2. Demonstrate ability to fill out his supervised farming program page in the record book.
3. Write a paragraph in the diary about his program and keep diary up to date in the record book.
4. Demonstrate ability to write an agreement for his farming program and write it in the record book.
5. Demonstrate ability to keep an accurate and balanced record of receipts.
6. Demonstrate ability to keep an accurate and balanced record of expenses.
7. Demonstrate ability to keep an accurate and balanced record of personal expenses.
8. Demonstrate ability to keep an accurate and balanced record of livestock feed and labor.
9. Demonstrate ability to make a beginning inventory of livestock, feed, seed, grain and poultry in the record book.
10. Demonstrate ability to make a beginning of the year inventory of receivables and payables in the record book.
11. Demonstrate ability to make an inventory of personal goods in the record book.
12. Demonstrate ability to transfer all figures from other areas of the book to the Progress Report and Net Worth Statement in the record book.

SPECIFIC OBJECTIVES

13. Demonstrate ability to keep breeding record up to date throughout the year in the record book.

14. Demonstrate ability to draw a map of his location in the record book.

15. Demonstrate ability to establish long range plans in the record book.

KEEPING RECORDS FOR THE SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM
UNIT II

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information and assignment sheets
3. Discuss terminal and specific objectives
4. Discuss information and assignment sheets
5. Give test
6. Provide student with Kansas Vocational Agriculture Record Book

Students:

1. Read objectives
2. Study information sheets
3. Complete each assignment sheet that pertains to your enterprise.
4. Take test
5. Fill out Record Book as it applies to your farm or agribusiness program

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheets
3. Transparency masters
    - TM 1--FFA Leadership Record
    - TM 2--Supervised Program
    - TM 3--Farming Program Agreement
    - TM 4--Receipts
    - TM 5--Receipts
    - TM 6--Expenses
    - TM 7--Expenses
    - TM 8--Depreciation, Inventory of Grains and Feeds
    - TM 9--Inventory of Livestock
    - TM 10-Inventory Personal Goods Net Worth and Progress Report
    - TM 11-Livestock Breeding, Production, and Mortality Record
    - TM 12-Livestock Feed and Labor Record
    - TM 13-Crop Record
    - TM 14-Inventory of Personal Goods
    - TM 15-Personal Expenditures
    - TM 16-Long Time Farming Program
4. Assignment sheet
    - #1--Account Book Exercise
5. Answers to assignment sheets
6. Test
7. Answers to test

References:

1. Kansas Vocational Agriculture Record Book
2. National Proficiency Awards: Placement in Sales and Services; Placement in Ag Production; Placement in Processing, National FFA Center, P.O. Box 15160, Alexandria, Virginia 22309

KEEPING RECORDS FOR THE SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM
UNIT II

INFORMATION SHEET

I. Kansas Vocational Agriculture Record Book

- A. Leadership page examples
    - 1. Offices and committees in FFA
        - a. FFA President, Uniontown chapter, May 30, 1974--May 30, 1975
        - b. Cooperative Activities chairman, Local, May 30, 1974--May 30, 1975
        - c. Fun Night chairman, Local, three weeks
    - 2. Additional Leadership
        - a. Creed contest, Local, 1st place
        - b. Greenhand conference, District, Attended
        - c. Livestock Judging, District, 3rd individual, 1st team
    - 3. Cooperation
        - a. Fruit sale, 10 boxes, sell and deliver
        - b. FFA Pig Coop, 5 shares, Coop membership
        - c. BOAC Community cleanup, 1/2 day work, worked April 23
    - 4. Miscellaneous Leadership
        - a. Freshman football team season
        - b. Church youth group, member for year
        - c. 4-H club treasurer, one year
        - d. Pep band, one year
- B. Comparison of farm improvement projects and supplementary programs
    - 1. A farm improvement project is much larger than a supplementary job. Some farm improvement projects may include many jobs, which if done separately, would be classified as supplementary jobs. For example: A farm improvement project such as orchard renovation might include pruning, spraying, and grafting. These jobs, if worked out as units, and not as a part of an

INFORMATION SHEET

improvement project, would be supplementary jobs. In the farm project of rebuilding the pasture, such jobs as controlled grazing, contour furrows and reseeding would probably be worked out. In some cases, a student might feel that it was not practical to take a farm improvement project in pasture renovation, but to work out a supplementary job in controlled grazing would be valuable.

2. In some instances, the same activity is listed both as an improvement project and as a supplementary job. In such cases, the deciding factor is the amount of work done by the student. As an illustration, contouring could be listed in both places. If the student lays out the contour lines with the help of an assistant, then plows the field himself, he should be given credit for an improvement project. On the other hand, if the father plants a field on the contour, through the suggestion and with some assistance from the student, credit for a supplementary job should only be given.

3. A supplementary farm job is what the name implies. It is a miscellaneous job experience, supplementary to the student's regular farming program. It improves efficiency, increases skill, and generates interest. Proficiency in certain activities such as milk testing or butchering may lead to occasional non-farm employment as the result of a reputation gained by an individual performing such work. For the most part, however, the results are seen in improved farm operation and management, either on the home farm or in connection with another farm.

C. Sample paragraph describing current supervised occupational experience program

> September 1--I own five bred four-year-old Hereford cows weighing about 1100 pounds each. I have one-half interest with my brother in a crossbred bred 450 pound sow. Dad and I own a 1973 225 amp Forney arc welder 50-50. I have ten acres of farm ground that is growing milo rented from Dad for 1/3 rent.

D. Sample livestock agreement

1. System of production--Feeder calf production
2. Size--Begin with five Hereford four-year-old bred cows
3. Financing--Use my bank account, savings, and borrow from bank as needed. Sell steers and extra heifers when weaned
4. Housing and equipment--Use Dad's buildings and equipment in exchange for labor (feeding Dad's cow herd)

INFORMATION SHEET

5. Feed--Rent pasture from Dad at going price per cow per season. My cows will be fed with Dad's cows and I will pay for actual feed fed based on average amount fed each cow in herd

   (NOTE: Sometimes the following statement is used. My labor on the farm will pay for feed fed to my livestock.)

6. Plans for continuation and expansion--Plan to keep back two heifers each year to increase beef cow herd.

E. Information on Using the Record Book

1. Guide to record book use:

   a. Make all entries with a pencil

   b. Bring the record book up to date once each week

   c. If problems arise, ask for help immediately (not after the book is graded.)

2. Grading the Record Book:

   a. The record will be graded, using the guide placed in the book for grading, during the school year. The three summer months will be graded the week after school begins and comprise one record book grade for the 9 weeks.

3. Preparing the Record Book for use:

   a. Print name, etc. on cover in INK

   b. Cut out tabs and use them when going through book

   c. Transfer from last years' record book: of fill in if first book

4. Account Book Hints

   a. Page 1--
      A--officers add committees (junior and freshman FFA officers)
      B--judging trips
      C--BBQ, slave auction, posters, concession stand, clean-up, pest control, vest sales; fire extinguishers, mechanics add livestock exhibits
      D--sports and organizations, class officer, FFA member

   b. Page 2--Improvement project is larger than a supplementary practice. On improvement projects list what was done in it. With the mechanics job at home probably list only the major ones.

INFORMATION SHEET

c. Page 3--Clippings on judging teams; pictures of improvement projects, activities and farming program (include exhibits)

d. Page 4--Probably 2-3 entries per week. At least include the major items such as judging teams, calf born or weather if nothing else

e. Page 7--Individually--be specific as possible and get signed

f. Page 10-25--Be sure you get all items down and have them in the correct columns. A + B = 1 + 16 or 17. If you have an agreement to exchange feed for labor put it in both exp. and rcpt. so they cancel out. On livestock sold or bought (also feed), the units times the price (not numbered columns) should equal the entry in Column A or B. When a loan is paid off it is an expense--when received a receipt.

g. Page 27--Receivables and Payables
line 17--in pocket or home on dresser
line 18--checking account only
line 22-25--savings account, bonds, C.D.S., loans made to someone
line 26--total of only lines 22 and 25 not ones above line 22
line 31-25--are people you owe
This box is to be worked with only on January 1 and December 31--no time in between these. Also the Regular Year plus New accounts should equal the total of the old accounts and End Year.

h. Page 26 and 27--Beginning and End of Year Livestock and Grain Inventories Value of these items must come from the Depreciation Schedule.

i. Page 26--Depreciation Schedule--determine salvage value by today's standards. If an animal is raised or bought at a value below its salvage value you may appreciate it the amount of feed put into the animal until it reaches the salvage value.
Depreciable balance equals cost minus salvage value
Method of Depreciation if straight line (S.L.), this means we take the same amount off each year. This is on livestock on machinery you are allowed to take off 20% additional the first year.
Remember: 1-15 you get full credit for that month; after the 16 you get credit for only half the month.
The top half of the columns which are divided in half should contain the salvage value

j. Page 28--Filled out at end of year. Col. 2 line 6,7,8,--be sure only those items

k. Page 29--line 62 needs corrected to 60 minus 61 instead of 59 minus 60

INFORMATION SHEET

l. Page 30--Freshman: Col. 1 and 3 are same and also fill out col. 2
Sophomore: Col. 1 here is same as col. 2 from freshman book.
Also col. 1 and 4 are the same and col. 2 and 3 should also be filled out.
Junior: Col. 1 here is same as col. 2 in soph. book. Also col. 1 and 5 are the same and col. 2,3 and 4 should be filled out.

m. Page 31--Lines 18 and 21 be sure you put only the items accounts received or receivable during the year (col. A--not col. 15).

n. Page 32-33--Fill in needed information

o. Page 36--Fill in each month--If prepared ration it does not need to be broken down; only list basic ration. If agreement to exchange feed for labor be sure to cancel out on exp. and rcpt. pages.

p. Page 38--Draw map

q. Page 39--Fill in
Operations--any pertaining to crop; put in all even though only some of them will show in this account book.
Record--fill in
Crop Analysis--figured from expenses and receipts
Practice--as much as possible
Supply and Disposal--fill in; these must equal

r. Page 43--Items you consider important; we figured these by the depreciation shown in class; total the present value column only and don't forget to add items as you receive them during the year, don't wait until the end of the year to re-figure.

s. Page 44--Personal expenses are just what they say

t. Page 49--Fill in these plans

(NOTE: When transferring from an old book to a new one be sure the correct amount is put in the right line and column.

Entries in pencil, name on front in ink, cut out tabs, ask questions if something is not understood, make corrections after book has been graded and before it is turned in the next time and
KEEP UP TO DATE.

The student should be ready to work in his (her) personal record book the following pages with teacher supervision: Inventories Pgs. 26,27, and 43; Progress Report & Net Worth Statement pg. 30; Breeding Record pg. 32 and 33; Map pg. 38; Long Range Goals pg. 49.)

F. Vocational Agriculture Record Book Check Sheet

Name ____________________

(NOTE: notes or comments written on another sheet and inserted in record book)
(NOTE: staple sheet on inside cover)

Item	Beginning	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Closing
Leadership														
Farm mechanics														
Diary														
Receipts														
Expenses														
Livestock breeding														
Livestock feeding														
Crop record														
Personal expenditures														
Agreement														
Inventories (26-27)														
Net worth statement														
Personal inventory														
Long time program														
Net Farm Income (28-29)														
Livestock Analysis														
Livestock Production														
Accuracy check														
Grade														

Complete or satisfactory (100 points possible)
Each day (--10)

Incomplete or unsatisfactory, first time noted (--5)
Incomplete or unsatisfactory, second time noted (--10)
Incomplete or unsatisfactory, third time noted
(Record book not acceptable)

Ag. I - 29-C

FFA

F.F.A. LEADERSHIP RECORD

A. OFFICES AND COMMITTEES IN F.F.A.

Comm., Ch., President, etc.	Unit—Local, State	Length of Service

B. ADDITIONAL LEADERSHIP

Participation in Public Speaking, Convention, Band, Judging Team, etc.	Unit—District, State, Regional	Rank—Delegate, Toastmaster, Gold Emblem

C. COOPERATION IN F.F.A.

Nature of Activity Buying and Selling, Gilt Ring, etc.	Scope—Number, Value, Head, Pounds Purchased or Sold	Responsibility of Service

D. MISCELLANEOUS LEADERSHIP

Participation—Such as President of Freshman Class, Secretary of Sunday School, Captain of Athletic Team, Member of Organization	Length of Service

Ag. I - 31-C

TM

SUPERVISED PROGRAM

A Long-Time Supervised Program Should Include Improvement Projects, Supplementary Practices and Farm Mechanics Jobs Decided Upon by the Boy, His Parents and Vocational Agriculture Teacher, Which Will Lead to Improving the Farm Home and Its Surroundings, and Learning Skills Essential to Proficiency in Farming.

IMPROVEMENT PROJECTS	Date	
	Planned	Completed
1.		
2.		
3.		
4.		
5		
6.		
7		
8.		
9.		
10.		
SUPPLEMENTARY FARM PRACTICES		
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11		
12.		
13.		
14		

TM 2

FARM MECHANICS JOBS AT SCHOOL	Date	
	Planned	Completed
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13		
14.		
15.		
FARM MECHANICS JOBS ON HOME FARM		
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

Ag. I - 33-C

FARMING PROGRAM AGREEMENT

This agreement is made this ____ day of ______________ 19____ by and between ______________ and ______________. This agreement covers the vocational agriculture farming program on a farm legally described as follows: ______________

The term of this agreement shall be one year commencing on the ____ day of ______________, 19____

Livestock Agreement

Terms of Agreement: (Kind and Size) (System of production and numbers)
____
____
____
____

Financing: ______________
____
____
____

Housing and Equipment: ______________
____
____
____

Feed: ______________
____
____
____

Plans for Continuation and Expansion: ______________
____
____
____

TM 3

Crop Agreement

Rent Division: (Acreage and Crops) ______________
____
____
____

Financing: ______________
____

Equipment: ______________
____

Seed fertilizer and Storage, Etc.: ______________
____

Plans for Continuation and Expansion: ______________
____

General Agreements

Management

I agree to set up production and marketing goals for my farming program. I will work out a seasonal plan of approved practices for each program and will follow them as closely as possible. I will seek, when necessary the advice of my vocational agriculture instructor and my parents.

Labor

I will assume the full labor responsibility for my farming program. I will continue to help my father with his farm operations and willingly cooperate with other members of my family.

Records and Reports

I will keep complete and accurate records using the vo-ag record book, and keep my vo-ag instructor properly informed of any happenings to my farming program.

Vocational Agriculture Instructor

The vo-ag instructor will visit and supervise my farming program.

Use of Farming Program Earnings

I agree to use the farming program opportunity given me by my parents to accumulate net worth to be applied toward my establishment in farming or to further my education.

Signed: ______________ (Student)
Approved ______________ (Instructor)
______________ (Parent)

Agreer

Ag. I - 35-C

RECEIPTS

	Month	Day	Amount Receivable	Amount Received	To Whom Sold	Items Sold	No. of Units	Total Weight	Price	MARKET LIVESTOCK SOLD		
										Cattle	Hogs	Sheep
1					Balance Carried Forward							
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34	TOTALS				Transfer totals to next page							
			A	B						1	2	3

Columns A & B should equal totals of columns 1-16

TM 4

Ag. I - 37-C

RECEIPTS

	Poultry	Eggs	Dairy Products	CROPS SOLD				Custom Work	Misc. Receipts	All Gov't. Payments	Dairy or Breeding Livestock and Other	NON-TAXABLE RECEIPTS. MONEY BORROWED ETC.	Taxable Non-Farm Receipts
				Wheat	Corn	Grain Sorghums	Others						
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
	4	5	6	7	8	9	10	11	12	13	14	15	16

TM 5

Rece

Ag. I - 39-C

EXPENSES

Line No.	Month	Day	Amount Charged	Amount Paid By Cash or Check	Paid To	Item	No. of Units	Total Weight	Price	All Feed Bought	Labor Hired	Farm Fuel & Oil (Not Auto or House)	All Auto Expense
1					Balance Carried								
2					Forward								
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35	Total				Transfer totals to next page								
			A	B						1	2	3	4

Col. A and B should equal the total of columns 1 to 17

EXPENSES

									NEW CAPITAL INVESTMENTS				
Line No.	Repairs Machinery and Lstk. Equipment	Trucking and Machine Hire	Seed and Other Crop Expense	Veterinary and Other Livestock Expense	Utilities	Taxes, Interest, Rent, etc.	Repairs, Buildings and Farm Improv.	Stocker or Feeder Livestock	Dairy or Breeding Livestock	Machinery and Equipment	Buildings Fences etc.	Paid on Notes etc.	Non-farm Business Expense
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
	5	6	7	8	9	10	11	12	13	14	15	16	17

TM 7

Expe.

Ag. I - 43-C

DEPRECIATION SCHEDULE

Line No.	Purchased Breeding and Dairy Stock	Date Acquired	Purchases This Year	Cost or Other Basis	Investment Credit	20% Additional 1st Yr. Allow Deprec.	Salvage Value	Depreciable Balance	Years of Life	Method of Depreciation	Remaining Value for Depreciation Begin. Year	This Year's Deprec.	Annual Deprec.	Remaining Value for Depreciation End of Year
1					XXX	XXX								
2					XXX	XXX								
3					XXX	XXX								
4					XXX	XXX								
5					XXX	XXX								
6	Totals (Lines 1 thru 5)				XXX	XXX			XX	XX				
7	Machinery and Equipment Farm Improvements													
8														
9														
10														
11														
12														
13	Totals (Lines 8 thru 12)								XX	XX				
14	**LAND INVESTMENT**		1	2	3	4	5	6						
15	Value of Land (Omitting Improvements) Owned		Acres @ $			per acre						XXX XX		
											7	8	9	10

Inventory of Grains and Feeds—Seeds and Supplies—Poultry

Line No.	GRAINS AND FEEDS	BEGINNING OF YEAR			END OF YEAR		
		Qnt.	Price Per Unit	Value	Qnt.	Price Per Unit	Value
16	Wheat						
17							
18							
19	Corn						
20							
21							
22	Grain Sorghums						
23							
24	Oats						
25	Barley						
26							
27	Sorghum Silage						
28	Total Grains and Feeds	XXX	XXX		XXX	XXX	
		11	12	13	14	15	16

SEEDS and SUPPLIES	BEGINNING OF YEAR			END OF YEAR		
	Qnt.	Price Per Unit	Value	Qnt.	Price Per Unit	Value
Milo Seed						
Total Seeds and Supplies	XXX	XXX		XXX	XXX	
	17	18	19	20	21	22

POULTRY	No.	Weight	Value	No.	Weight	Value
Hens						
Pullets						
Roosters						
Broilers						
Total Poultry						
	23	24	25	26	27	28

INVENTORY OF LIVESTOCK — RECEIVABLES AND PAYABLES

Line No.	BEEF CATTLE	BEGINNING OF YEAR No.	BEGINNING OF YEAR Total Weight	BEGINNING OF YEAR Total Value	END OF YEAR No.	END OF YEAR Total Weight	END OF YEAR Total Value
1	Cows						
2							
3	Heifers						
4							
5	Bulls						
6	Bull Calves						
7	Heifer Calves						
8	Market Cattle						
9	Feeder Calves						
10							
11	Total Beef Cattle						
12							
13	HOGS						
14	Sows						
15							
16	Bred Gilts						
17	Boars						
18							
19	Market Hogs						
20							
21	Fall Pigs						
22	Total Hogs						
23							
24	SHEEP						
25	Ewes, Range						
26	Ewes, Native						
27	Ewes, Purebred						
28	Rams						
29							
30	Ewe Lambs						
31							
32	Ram Lambs						
33							
34	Market Lambs						
35	Total Sheep						
		1	2	3	4	5	6

Line No.	DAIRY CATTLE	BEGINNING OF YEAR No	BEGINNING OF YEAR Total Weight	BEGINNING OF YEAR Total Value	END OF YEAR No	END OF YEAR Total Weight	END OF YEAR Total Value
1	Cows						
2	Heifers						
3							
4	Bulls						
5	Bull Calves						
6	Heifer Calves						
7	Total Dairy Cattle						
8	Other						
9							
10	Total Other						
		7	8	9	10	11	12

Deprec
Invento

INVENTORY OF FARM RECEIVABLES

				Beginning of Year	New Accounts	Received on Old Accounts	End of Year
17	Cash on hand						
18	Cash in bank (less outstanding checks)						
19	Totals		L. 17 & 18				
20	Accounts Receivable:						
21	Persons Who Owe Me	Date Due	Interest Rate				
22							
23							
24							
25							
26	Totals		L. 22-25				

INVENTORY OF FARM PAYABLES

	ACCOUNTS PAYABLE Persons I Owe	Date Due	Interest Rate	Beginning of Year	New Accounts	Paid on Old Accounts	End of Year
31							
32							
33							
34							
35			Totals				
				13	14	15	16

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NET WORTH STATEMENT

Line No.	ASSETS AND LIABILITIES		Beginning of Year		End of Year	
1	Machinery, Equipment	P26 L13 Col. 7 and 10				
2	Grains and Feeds	P26 L28 Col. 13 and 16				
3	Seeds and Supplies	P26 L19 Col. 19 and 22				
4	Poultry	P26 L28 Col. 25 and 28				
5	Dairy Cattle	P27 L7 Col. 9 and 12				
6		P27 L10 Col. 9 and 12				
7	Beef Cattle	P27 L11 Col. 3 and 6				
8	Hogs	P27 L22 Col. 3 and 6				
9	Sheep	P27 L35 Col. 3 and 6				
10	Receivables Cash	P27 L19 Col. 13 and 16				
11	Accounts	P27 L26 Col. 13 and 16				
12	Total Working Capital	(Lines 1 to 11)				
13	Payables	P27 L35 Col. L3 and 16				
14	Net Working Capital	(L12 less L13)				
15						
16	Farm Buildings (Perm't.)	P26 in Col. 7 and 10				
17	Land Owned	P26 L15 Col. 7 and 10				
18	Total Buildings and Land	(L16 + L17)				
19	Mortgage on Farm Owned and Operated					
20	Net Real Estate Equity	(L18 less L19)				
21	Farm Business Net Worth	(L14 + L20)				
22	Personal Net Worth	P 43				
23	Total Assets (L21·L22)					
24	Change in Farm Business Net Worth (L21, Col. 2 less Col. 1)					
25	Net Non-farm Business Income (P28, L67)					
26	Cash Value Gifts Each Year					
27	Gain in Net Worth Minus Gifts and Net Non-farm Bus. Income					
28	Net Farm Income (accrual basis, P28, L62)					
29	Net Farm Income (cash basis, P29, L59)					
			1		2	

PROGRESS REPORT

Line No.	Value on Jan. 1, 19___ Beginning First Year		Value on Jan. 1, 19___ Second Year		Value on Jan. 1, 19___ Third Year		Value on Jan. 1, 19___ Fourth Year		Value on Jan. 1, 19___ Fifth Year	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24	XXX	XX								
25	XXX	XX								
26	XXX	XX								
27	XXX	XX								
28	XXX	XX								
29	XXX	XX								
	3		4		5		6		7	

LIVESTOCK BREEDING, PRODUCTION AND MORTALITY RECORD

First Service Date	Second Service Date	CATTLE RECORD				Date Due	Date Born	Sex of Calves Born	Deaths Before Weaned	Total Calves Weaned
		Sire Number	Sire Name	Dam Number	Name of Dam					

KIND OF FLOCK	SHEEP FLOCK RECORD						Lambing Season Dates Born		Number Born	Deaths Before Weaned	Total Lambs Weaned
	Number in Flock	Ram Used	Rams Dates with Flock		Dates Due						
			From	To	From	To	From	To			
Range Ewes											
Native Ewes											
Purebred Ewes											
					Tally (IIII) Numbers in columns 1 and 2		Total				
										1	2

PERIOD OF PRODUCTION	POULTRY RECORD			Death Loss	Total Raised	Percent Mortality
	Breed	Production Dates	Number			
		To				
		To				
		To				
	XXXXX	XXX To XXX	XXXX	Total	Total	Total

Dam		Sire		SWINE RECORD					Number Pigs Born		Deaths Before Weaned		Pigs Weaned	
Number	Name	Number	Name	First Service Date	Second Service Date	Litters	Date Due	Date Born	Spring	Fall	Spring*	Fall*	Spring	Fall
						Spring				XXX		XXX		XXX
						Fall			XXX		XXX		XXX	
						Spring				XXX		XXX		XXX
						Fall			XXX		XXX		XXX	
						Spring				XXX		XXX		XXX
						Fall			XXX		XXX		XXX	
						Spring				XXX		XXX		XXX
						Fall			XXX		XXX		XXX	
						Spring				XXX		XXX		XXX
						Fall			XXX		XXX		XXX	
						Spring				XXX		XXX		XXX
						Fall			XXX		XXX		XXX	
*Tally (IIII) Numbers in columns 5 and 6								Total						
									3	4	5	6	7	8

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LIVESTOCK FEED AND LABOR RECORD FOR

Kind ____________ Breed ____________

Line No.	Month	Average Number of Animals	CONCENTRATES						ROUGHAGE						Pasture Value	Raised By Student	Bought By Student	Total Value For Month	HOURS LABOR	
			Qnt.	Value	Qnt	Value	Qnt	Value	Qnt.	Value	Qnt	Value	Qnt.	Value					Student	Hired
1	Jan.														$					
2	Feb																			
3	March																			
4	April																			
5	May																			
6	June																			
7	July																			
8	Aug.																			
9	Sept.																			
10	Oct																			
11	Nov.																			
12	Dec.																			
13	Total																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Kind ____________ Breed ____________

Line No.	Month	Average Number of Animals	CONCENTRATES						ROUGHAGES						Pasture Value	Raised By Student	Bought By Student	Total Value For Month	HOURS LABOR	
			Qnt.	Value	Qnt	Value	Qnt.	Value	Qnt.	Value	Qnt.	Value	Qnt.	Value					Student	Hired
14	Jan.														$					
15	Feb.																			
16	March																			
17	April																			
18	May																			
19	June																			
20	July																			
21	August																			
22	Sept																			
23	Oct																			
24	Nov																			
25	Dec																			
26	Total																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

TM 12

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CROP PRODUCTION RECORD

1	Acres		
2	Yield per acre		
3	Total Production (bu. or ton)		
4	Unit value		
5	Total value		
6	Value per acre		
7	Per cent landlord's share		
8	Value landlord's share		
9	Production my share		
10	Value my share		

CROP ANALYSIS

Line No.			
	RECEIPTS:		
11	Value of Crop as Grain, Stover, Fodder L. 5		
12	Value of Crop as Silage L. 5		
13	Value of Crop as Hay, Temporary Pasture L. 5		
14	Value of Crop as Garden Produce L. 5		
15	Total Receipts		
16	EXPENSES: (From Expense Pages)		
17	Hired Labor		
18	Machinery Cost		
19	Machine Work Hired Col. 3		
20	Seed — Variety Treatment Qnt.		
21	Fertilizer — Kind Quantity		
22	Spray Materials Kind		
23	Other Costs		
24	Total Expenses		
25	NET INCOME EXCLUDING LAND CHARGE:		
26	Land Charge: Cash or Value of Landlord's Share (L. 8)		
27	Interest and Taxes on Owned Land (Land Value × 5%)		
28	Total Land Charge (L. 26 + L. 27)		
29	NET INCOME (L. 25 less L. 28)		
30	Furnished by Landlord (L. 17 thru L. 23)		
31	Student's Share (L. 29 + L. 30)		

TM 13

CROP RE[illegible]RD FOR ____________________ FIELD LETTER ____________

OPERATION

Month	Day	OPERATION	FUEL		OIL	MACHINE WORK	LABOR HOURS	
			Qnt.	Cost	Cost	Hired	Boy	Hired
Totals		XXXXXXXXXXXXX						
				1	2	3	4	5

PRACTICE

Land use last year	
Soil Texture	
Acidity Test	
Organic Matter Test	
Soil Type	
Topography	
Extent of Erosion	
Terraced — Yes or No	
Contoured — Yes or No	
Last time in legume — Year	
Soil moisture seeding time — in.	
Quality of product	
Damage — Kind Loss of yield %	

SUPPLY AND DISPOSAL

SUPPLY	Bu.
Inventory beginning of year P. 26	
Raised during year L. 3	
Bought during year Exp. P. Col. 1 & 7	
Total Supply	

DISPOSAL

Sold during Year Recp. P. Col. 7-10	
Rent to Landlord L. 3 minus L. 9	
Used for Seed L. 10	
Inventory End of Year P. 26	
Fed to Livestock P. 36-37	
Total Disposal	

Crop Recor.

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INVENTORY OF PERSONAL GOODS

Number	Item	Date Purchased	Original Cost	Years of Useful Life	Present Value	Number	Item	Date Purchased	Original Cost	Years of Useful Life	Present Value
					$	Forwarded		XXXX	XXXX	XXX	$
Carry forward		XXXX	XXXX	XXX		Total		XXXX	XXXX	XXX	

TM 14

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PERSONAL EXPENDITURES

Month	Day	Item	Personal	Education Recreation	Contributions	Other
			$	$	$	$
		Transfer Totals	$	$	$	$

Month	Day	Item	Personal		Education Recreation		Contributions		Other	
		Carried Forward	$		$		$		$	
		Transfer Totals	$		$		$		$	

PLANS FOR LONG TIME FARMING PROGRAM

Cl[illegible] as to age and sex	CURRENT YEAR 19____		AS PLANNED FOR THE NEXT THREE YEARS		
	Planned Program	Completed Program	19__	19__	19__
	Number	Number	Number	Number	Number
Beef Cattle					
Dairy Cattle					
Hogs					
Sheep					
Poultry					

CROPS	CU[illegible]T YEAR 19____		AS PLANNED FOR THE NEXT THREE YEARS		
	Planned Program	Completed Program	19__	19__	19__
	Acres	Acres	Acres	Acres	Acres

EQUIPMENT (Indicate year to be secured by X mark)	CURRENT YEAR 19____		AS PLANNED FOR THE NEXT THREE YEARS		
	Planned Program	Completed Program	19__	19__	19__

Good farming programs do not just happen, they must be planned step by step. The plans must be followed up by action. Don't make a dream plan, make a plan you feel will be a money maker and one you would like to follow. In setting up your livestock program, the crop and pasture land on the farm may be a governing factor. As you make your long time plans, consult with your teacher, your parents, and others whose judgment you respect.

GESTATION TABLE

Date of Service	Date Animal is to Give Birth to Young			Date of Service	Date Animal is to Give Birth to Young		
	Cow, 283 days	Sow, 113 days	Ewe, 148 days		Cow, 283 days	Sow, 113 days	Ewe, 148 days
Jan. 1	Oct. 10	Apr. 23	May 28	July 10	Apr. 18	Oct. 30	Dec. 4
Jan. 11	Oct. 20	May 3	June 7	July 20	Apr. 28	Nov. 9	Dec. 14
Jan. 21	Oct. 30	May 13	June 17	July 30	May 8	Nov. 19	Dec. 24
Jan. 31	Nov. 9	May 23	June 27	Aug. 9	May 18	Nov. 29	Jan. 3
Feb. 10	Nov. 19	June 2	July 7	Aug. 19	May 28	Dec. 9	Jan. 13
Feb. 20	Nov. 29	June 12	July 17	Aug. 29	June 7	Dec. 19	Jan. 23
Mar. 2	Dec. 9	June 22	July 27	Sept. 8	June 17	Dec. 29	Feb. 2
Mar. 12	Dec. 19	July 2	Aug. 6	Sept. 18	June 27	Jan. 8	Feb. 12
Mar. 22	Dec. 29	July 12	Aug. 16	Sept. 28	July 7	Jan. 18	Feb. 22
Apr. 1	Jan. 8	July 22	Aug. 26	Oct. 8	July 17	Jan. 28	Mar. 4
Apr. 11	Jan. 18	Aug. 1	Sept. 5	Oct. 18	July 27	Feb. 7	Mar. 14
Apr. 21	Jan. 28	Aug. 11	Sept. 15	Oct. 28	Aug. 6	Feb. 17	Mar. 24
May 1	Feb. 7	Aug. 21	Sept. 25	Nov. 7	Aug. 16	Feb. 27	Apr. 3
May 11	Feb. 17	Aug. 31	Oct. 5	Nov. 17	Aug. 26	Mar. 9	Apr. 13
May 21	Feb. 27	Sept. 10	Oct. 15	Nov. 27	Sept. 5	Mar. 19	Apr. 23
May 31	Mar. 9	Sept. 20	Oct. 25	Dec. 7	Sept. 15	Mar. 29	May 3
June 10	Mar. 19	Sept. 30	Nov. 4	Dec. 17	Sept. 25	Apr. 8	May 13
June 20	Mar. 29	Oct. 10	Nov. 14	Dec. 27	Oct. 6	Apr. 18	May 23
June 30	Apr. 8	Oct. 20	Nov. 24				

ASSIGNMENT SHEET #1--ACCOUNT BOOK EXCERCISE
(Receipts, Expenses, Personal Expenses & Feed Record)

1. Expenses:

Jan 1 Account book $.35
4 Bought 2 fair steers from Dad (520# @ 47.00/cwt.)
7 Meal ticket $8.00
22 Went to show $1.35
31 Settled with Dad for feed on steers (all in exchange for labor)
Feb 2 Hired Jim Nelson to fix pens for hogs (8 hrs. @ 1.80/hr.)
4 Bought 2 ton hog feed from Anderson Grain $76.00 (charged)
5 Bought 12 feeder pigs from Louis Overmiller (50#--$38.00/head)
7 Meal ticket $8.00
20 Paid $200.00 on note at Smith County Bank
24 Vaccine for hogs from Dr. Rundle (2 bottles @ 2.50/bottle)
27 Put $120.00 in savings account at Smith County State Bank
28 Settled with Dad for feed on steers (all in exchange for labor)
Mar 3 Clothes $21.50
5 Stock racks from Coles--$103.19
7 Meal ticket $8.00
10 Metal from school for 3-point hog carrier--$17.46
11 Meal at District Livestock Judging contest--$2.17
15 March of Dimes--$1.50
19 Bought bred heifer from Mike Weltmer--$380.00
22 Feed from Anderson Grain (two ton @ 38.00/ton charged)
27 Paid Anderson grain feed bill
31 Total for fist quarter of year
31 Settled with Dad for feed on steers (all in exchange for labor)

2. Receipts:

Jan 9 Sold 10 market hogs to J. C. Chance (200# @ 37.50/cwt.)
31 Lambert's paid me for working (32 hors. @ 1.80/hr.)
Feb 3 Borrowed $55.00 from State Bank @ 7 1/2% interest for 6 months
20 Mom gave me $5.00 for chores around house
Mar18 Sold 125 bushels of wheat to Frieling Grain (3.75/bu.)
26 Sold 12 guage shotgun to Kevin Schenk (35.00)
31 Total for first quarter of year

3. Settled with Dad on feed bill: March 30
He paid feed for steers for work I do at home farm
Steers eat 4# feed (grain) 5# alfalfa and 10# cane daily
Feed grain is $60,00/ton, alfalfa is $30.00/ton and cane is $15.00/ton
I work 10 minutes daily feeding and caring for steers on the average

ASSIGNMENT SHEET #1

RECEIPTS

Line	Month	Day	Amount Receivable	Amount Received	To Whom Sold	Items Sold	No. of Units	Total Weight	Price	MARKET LIVESTOCK SOLD		
										Cattle	Hogs	Sheep
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
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29												
30												
31												
32												
33												
34	TOTALS				Transfer totals to next page							
			A	B						1	2	3

Columns A & B should equal totals of columns 1-16

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ASSIGNMENT SHEET #1

RECEIPTS

Line No.	Poultry	Eggs	Dairy Products	CROPS SOLD				Custom Work	Misc. Receipts	All Gov't. Payments	Dairy or Breeding Livestock and Other	NON-TAXABLE RECEIPTS. MONEY BORROWED ETC.	Taxable Non-Farm Receipts
				Wheat	Corn	Grain Sorghums	Others						
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
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32													
33													
34													
		5	6	7	8	9	10	11	12	13	14	15	16

Receip

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ASS MENT SHEET #1

EXPENSES

Line No.	Month	Day	Amount Charged	Amount Paid By Cash or Check	Paid To	Item	No. of Units	Total Weight	Price	All Feed Bought	Labor Hired	Farm Fuel & Oil (Not Auto or House)	All Auto Expense
1					Balance Carried								
2					Forward								
3													
4													
5													
6													
7													
8													
9													
10													
11													
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22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35	Total				Transfer totals to next page								
			A	B						1	2	3	4

Col. A and B should equal the total of columns 1 to 17

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SSIGNMENT SHEET #1

EXPENSES

Line No.	Repairs Machinery and Lstk. Equipment	Trucking and Machine Hire	Seed and Other Crop Expense	Veterinary and Other Livestock Expense	Utilities	Taxes, Interest, Rent, etc.	Repairs Buildings and Farm Improv.	Stocker or Feeder Livestock	NEW CAPITAL INVESTMENTS			Paid on Notes etc.	Non-farm Business Expense
									Dairy or Breeding Livestock	Machinery and Equipment	Buildings Fences etc.		
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
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33													
34													
35													
	5	6	7	8	9	10	11	12	13	14	15	16	17

Expens

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ASSIGNMENT SHEET #1

PERSONAL EXPENDITURES

Month	Day	Item	Personal	Education Recreation	Contributions	Other
			$	$	$	$
		Transfer Totals	$	$	$	$

Month	Day	Item	Personal		Education Recreation		Contributions		Other	
		Carried Forward	$		$		$		$	
		Transfer Totals	$		$		$		$	

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ASSIGNMENT SHEET #1

LIVESTOCK FEED AND LABOR RECORD FOR

______________ Kind ______________ Breed

Line No.	Month	Average Number of Animals	CONCENTRATES						ROUGHAGE						Pasture Value	Raised By Student	Bought By Student	Total Value For Month	HOURS LABOR	
			Qnt.	Value	Qnt.	Value	Qnt.	Value	Qnt.	Value	Qnt.	Value	Qnt.	Value					Student	Hired
1	Jan.														$					
2	Feb.																			
3	March																			
4	April																			
5	May																			
6	June																			
7	July																			
8	Aug.																			
9	Sept.																			
10	Oct.																			
11	Nov.																			
12	Dec.																			
13	Total																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

______________ Kind ______________ Breed

Line No.	Month	Average Number of Animals	CONCENTRATES						ROUGHAGES						Pasture Value	Raised By Student	Bought By Student	Total Value For Month	HOURS LABOR	
			Qnt.	Value	Qnt.	Value	Qnt.	Value	Qnt.	Value	Qnt.	Value	Qnt.	Value					Student	Hired
14	Jan.														$					
15	Feb.																			
16	March																			
17	April																			
18	May																			
19	June																			
20	July																			
21	August																			
22	Sept																			
23	Oct.																			
24	Nov																			
25	Dec.																			
26	Total																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

ANSWERS TO ASSIGNMENT SHEET #1

RECEIPTS

Line No.	Month	Day	Amount Receivable		Amount Received		To Whom Sold	Items Sold	No. of Units	Total Weight	Price		MARKET LIVESTOCK SOLD					
													Cattle		Hogs		Sheep	
1	1	9			825	00	J.C. Chance	market hogs	10	2200	82	50						
2		31			57	60	Lamberts	labor	32		1	80						
3		31			15	12	Dad	exchge labor/feed										
4	2	3			550	00	State Bank	loan @ 6% - 6 mos										
5		20			5	00	Mom	chores										
6		28			15	12	Dad	exchge labor/feed										
7	3	18			468	75	Frieling Grain	wheat	125	7500	3	75						
8		26			35	00	Kevin Schenk	12 gauge shotgun										
9		31			16	74	Dad	exchge labor/feed										
10	3	31			1,988	33	Total								825	00		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
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34	TOTALS						Transfer totals to next page											
			A		B								1		2		3	

Columns A & B should equal totals of columns 1-16

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ANSWERS TO ASSIGNMENT SHEET #1
RECEIPTS

	Poultry	Eggs	Dairy Products	CROPS SOLD				Custom Work	Misc. Receipts	All Gov't. Payments	Dairy or Breeding Livestock and Other	NON-TAXABLE RECEIPTS, MONEY BORROWED ETC.	Taxable Non-Farm Receipts
				Wheat	Corn	Grain Sorghums	Others						
1													
2													57 60
3									15 12				
4												550 00	
5									5 00				
6									15 12				
7				468 75									
8													35 00
9									16 74				
10				468 75					51 98			550 00	92 60
11													
12													
13													
14													
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34													
	4	5	6	7	8	9	10	11	12	13	14	15	16

Receip

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EXPENSES

Line	Month	Day	Amount Charged	Amount Paid By Cash or Check	Paid To	Item	No. of Units	Total Weight	Price	All Feed Bought	Labor Hired	Farm Fuel & Oil (Not Auto or House)	All Auto Expense
1					Balance Carried								
2					Forward								
3	1	4		488 80	Dad	show steers	2	1,040#	244 40				
4		31		15 12	Dad	feed/labor				15 12			
5	2	2		14 40	Jim Nelssen	labor	8		1 80		14 40		
6		4	76 00		Anderson Grain	hog feed	2	4,000#	38 00	76 00			
7		5		456 00	Louis Overmiller	feeder pigs	2	600#	38 00				
8		24		5 00	Dr. Rundle	vaccine	2		2 50				
9		27		120 00	Smith Co. St. Bank	savings acc't							
10		28		15 12	Dad	feed/labor				15 12			
11	3	5		103 19	Coles	stock racks							
12		10		17 46	School	metal							
13		19		380 00	Mike Weltmer	bred heifer	1		380 00				
14		22	76 00		Anderson Grain	feed	2	8,000#	38 00	76 00			
15		27		152 00	Anderson Grain	Col A Acc't-lines 6,14							
16		31		16 74	Dad	feed/labor				16 74			
17	3	31	152 00		Total					198 98	14 40		
18				1983 83									
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35	Total				Transfer totals to next page								
			A	B						1	2	3	4

Col. A and B should equal the total of columns 1 to 17

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ANSWERS TO ASSIGNMENT SHEET #1

EXPENSES

									NEW CAPITAL INVESTMENTS				
Line No.	Repairs Machinery and Lstk. Equipment	Trucking and Machine Hire	Seed and Other Crop Expense	Veterinary and Other Livestock Expense	Utilities	Taxes, Interest, Rent, etc.	Repairs Buildings and Farm Improv.	Stocker or Feeder Livestock	Dairy or Breeding Livestock	Machinery and Equipment	Buildings Fences etc.	Paid on Notes etc.	Non-farm Business Expense
1								488 80					
2													
3													
4													
5													
6								456 00					
7												200 00	
8				5 00									
9													120 00
10													
11										103 19			
12	17 46												
13									380 00				
14													
15												152 00	
16													
17	17 46			5 00				944 80	380 00	103 19		352 00	120 00
18													
19													
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35													
	5	6	7	8	9	10	11	12	13	14	15	16	17

Expen

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NSWERS TO ASSIGNMENT SHEET #1

PERSONAL XPENDITURES

Month	Day	Item	Personal	Education Recreation	Contributions	Other
1	1	Account Book	$	$ .35	$	$
	7	Meal ticket	8.00			
	22	Show		1.35		
2	7	Meal ticket	8.00			
3	3	Clothes	21.50			
	7	Meal ticket	8.00			
	11	Meal	2.17			
	15	March of Dimes			1.50	
3	31	Total	47.67	1.70	1.50	
		Transfer Totals	$	$	$	$

Month	Day	Item	Personal	Education Recreation	Contributions	Other
		Carried Forward	$	$	$	$
		Transfer Totals	$	$	$	$

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ANSWERS TO ASSIGNMENT SHEET #1

LIVESTOCK FEED AND LABOR RECORD F

Kind ____________ Breed ____________

Line No.	Month	Average Number of Animals	CONCENTRATES						ROUGHAGE						Pasture Value	Raised By Student	Bought By Student	Total Value For Month	HOURS LABOR	
			Qnt.	Value	Qnt.	Value	Qnt.	Value	Qnt.	Value	Qnt.	Value	Qnt.	Value					Student	Hired
1	Jan.														$					
2	Feb.																			
3	March																			
4	April																			
5	May																			
6	June																			
7	July																			
8	Aug.																			
9	Sept.																			
10	Oct.																			
11	Nov.																			
12	Dec.																			
13	Total																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Fair Steers
Kind

Crossbred
Breed

Line No	Month	Average Number of Animals	CONCENTRATES						ROUGHAGES						Pasture Value	Raised By Student	Bought By Student	Total Value For Month	HOURS LABOR	
			Milo						Alfalfa		Cane									
			Qnt.	Value 60/ton	Qnt.	Value	Qnt.	Value	Qnt.	Value 30/ton	Qnt.	Value 15/ton	Qnt.	Value					Student	Hired
14	Jan. 4	2	224	6 72					280	4 20	560	4 20			$		15 12	15 12	4 2/3	
15	Feb.	2	224	6 72					280	4 20	560	4 20					15 12	15 12	4 2/3	
16	March	2	248	7 44					310	4 65	620	4 65					16 74	16 74	5 1/3	
17	April																			
18	May																			
19	June																			
20	July																			
21	August																			
22	Sept																			
23	Oct																			
24	Nov																			
25	Dec																			
26	Total																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

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PLANNING AND IMPLEMENTING THE SUPERVISED TRAINING PROGRAM IN AGRIBUSINESS

UNIT III

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to select an agribusiness job from the various types of jobs available, establish goals for his four years in Vocational Agriculture, and set ways and means of reaching those goals. The student should be able to apply the fundamentals of beginning record keeping. Each student involved should complete the record book with all business figures one hundred percent accurate. The information pages in the record book ninety percent accurate.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Complete the sheet titled "Other Information" for agribusiness.
2. By using the supervised occupational experience agreement example, complete the student's own agreement.
3. By using the example on the candidates occupational objective page, complete his/her own plan for his/her occupational objective.
4. By using the specific experience example, complete his/her plan for specific experiences to be gained.
5. Complete the agribusiness record book to the teachers satisfaction.

SUPERVISED OCCUPATIONAL EXPERIENCE RECORDS
FOR AGRIBUSINESS
UNIT III

SUGGESTED ACTIVITIES

(NOTE: this unit is designed for individualized study for students having programs in agribusiness)

Instructor:

1. Provide students with objective sheet
2. Provide students with information and assignment sheets
3. Discuss terminal and specific objectives
4. Discuss information and assignment sheets
5. Evaluate completed assignment sheets
6. Give additional sheets for record book

Student:

1. Read objectives
2. Study information sheets
3. Complete assignment sheets
4. Hand in completed assignment sheets for evaluation
4. Staple completed assignment sheets in record book

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheets
3. Assignment sheets
    #1--Other Information
    #2--Occupational objective page
    #3--Specific experiences to be gained
    #4--Supervised occupational experience agreement

References:

1. Vocational Agriculture Record Book

2. National Proficiency Awards for 1974-75: Placement in Sales and Services; Placement in Processing; American Farmer and Agribusinessman, National FFA Center, P.O. Box 15160, Alexandria, Virginia 22309

INFORMATION SHEET #1

Candidate Occupational Objective: to become the manager of the Uniontown Implement Sales and Repair Shop.

What it will take to reach this occupational objective	Plans for reaching occupational objective	Extent of experiences already received in reaching occupational objective
Experience 1. Work in as many areas in this field so my training experiences will start me on my way towards my career goal of managership of the Implement Shop	Work for dealer in Uniontown while in high school during the school year and extend into summer employment	I am currently employed by the dealer in Uniontown and have set up a 4 year plan of experiences to be completed here and have an agreement with Mr. Smith for summer employment and after two years of Vo-Tech, I plan to return as a mechanic at the shop
Education 2 years Vo-Tech and major in mechanics	Plan to attend Vo-Tech for 2 years and major in mechanics	Three months working for dealership
Cost $300 plus room and board	Save money earned while on the job to finance education	Earned $396 while in employment at shop (9/1-12/31) Saved.
Other		

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INFORMATION SHEET #2

Specific experiences to be gained: indicate the specific experiences to be gained that will assist in achieving your desired career goal.

Occupational objective: Manager of a farm implement sales and repair shop

Name of business in which agribusiness experience is obtained	Specific Experience and/or Skills Developed	Indicate how each experience will assist you towards achieving your occupational goal
Uniontown Implement Sales and Repair Shop	1. Organization of shop area and tools	a. Realizing the value of a clean shop b. Understand the value of proper tool location c. Training in organizing the repair shop

Replaces Page 7 in Record Book

INFORMATION SHEET #3

Supervised Occupational Experience Agreement:
EXAMPLE:
Starting date: 9/1/74
Ending date: 8/21/78--with chance for employment while in Vo-Tech and also after completion of schooling

Hours: 2 hours after school each day with 8 hours on Saturday; 44 hours during summer each week with three weeks off

Wages: start at $1.90 per hour with increase of $.05 per hour each two months up to $2.60 per hour while in school

Experiences:

1. Learn the responsibilities towards the company
    a. Attitude
    b. Communications
    c. Employee economics
2. Organization of shop area and tool storage
3. Learn to be a mechanic's helper and take directions
4. Procedures in loading and delivering machinery
5. Repair and assembling machinery problems
6. Learn to read repair and parts manuals, and locate parts in storage
7. Learn to start, keep and price a customer's bill
8. Learning to order parts and check in
9. Develop skills in salesmanship of products

ASSIGNMENT SHEET #1

Other information (for Agribusiness pages)

Date entered high school______________________________

Years of vocational agriculture offered in high school________

Years of vocational agriculture completed__________________

Enrolled in vocational agriculture (yes,no)________________

Parents name,(if living)Father__________________________
Mother__________________________

Numbers of brothers______, ages________________________

Number of sisters_______, ages________________________

Father's Occupation__________________________________

ASSIGNMENT SHEET #2

(NOTE: No supplemental pages are to be added except pages for photographs)

Qualifying Programs: Programs that provide exploratory experiences and to develop occupational competencies needed by individuals preparing to enter the occupations of Sales and Service in off-farm agriculture. Experiences may be in feed and other farm supply stores, agricultural equipment dealerships, lumber and building supply stores, florist shops, garden centers and lanscape maintenance firms (For more information on this program, please consult your chapter Agricultural Proficiency Award Guide.)

Applicant's Vocational Objective: To be completed by the applicant. State your ultimate career goal and your plan for achieving this goal. This section will not be scored by the judges, its only purpose is to define the basis for the experiences you received through your experience program.

Candidate's occupational objective____

What it will take to reach this occupational objective	Plans for reaching occupational objective	Extent of experiences already received in reaching occupational objective
Experience:		
Education:		
Cost:		
Other:		

ASSIGNMENT SHEET #3

Specific Experience to be Gained: indicate the specific experiences to be gained that will assist in achieving your desired career goal.

Name of Business Agribusiness experience is obtained	Specific experience and/or skills devloped	Indicate how each experience will assist you towards achieving your occupational goal

ASSIGNMENT SHEET #4

Supervised Occupational Experience Agreement

Starting date: ____________________

Ending date: ____________________

Hours: ____________________

Wages: ____________________

Experiences: ____________________

FHA YOUTH LOAN PROGRAM
UNIT IV

TERMINAL OBJECTIVES

After completion of this unit, the student should be able to identify the functions associated with the FHA Youth Loan Program. He should be able to recognize the requirements and policies for obtaining a youth loan and relate them to his present program. This knowledge will be evidenced through submitting a report applying for a youth loan and by scoring eighty-five percent on a post test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define four terms associated with the FHA Youth Loan Program.
2. List five requirements to qualify for a youth loan.
3. Name four enterprises in which youth loans can be used to make purchases.
4. List specific items which can be purchased with money from youth loans.
5. List three ways youth loans are secured.
6. Discuss in writing the repaying of youth loans.
7. Demonstrate the ability to fill out a budget plan when applying for an FHA Youth Loan Program.

FHA YOUTH LOAN PROGRAM
UNIT IV

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide each student with information sheets
3. Make transparencies
4. Discuss terminal and specific objectives with students
5. Discuss information sheets
6. Handout sample application and budget plan and have students practice filling out
7. Give test

Students:

1. Read objectives
2. Study information sheets
3. Take test

Included in this unit:

1. Objectives
2. Information sheets
3. Transparency masters
   - TM 1--FHA Loan Application (two pages)
   - TM 2--Budget Plan Form
   - TM 3--Approval Form
4. Test
5. Answers to test

Additional Materials:

1. Bulletin No. 1059 USDA "Youth Project Loans," supplied by Farmers Home Administration

FHA YOUTH LOAN PROGRAM

INFORMATION SHEET

I. Terms and Definitions

- A. FHA--The Farmers Home Administration of the U.S. Department of Agriculture channels credit to farmers, rural residents, and communities and helps borrowers gain maximum benefit from loans through counseling and technical assistance
- B. Security--an item of value pledged to make secure the payment of a debt
- C. Promissory note--a written promise to pay on demand or at a fixed future time a certain sum of money to a specific lender or lending institution
- D. Lien--a right of the lender or lending institution to control a charge against the property of a borrower until the charge is paid
- E. Repayment schedule--a schedule established to repay a loan on set dates in the future until the loan is paid in full

II. The FHA Youth Loan is designed for:

- A. Rural residents under 21 years of age
- B. Establishing and operating income producing farm or non-farm enterprises
- C. Enterprises of modest size

III. Requirements to secure a FHA Youth Loan:

- A. Be a citizen of the United States
- B. Be under 21 years old
- C. Live in the open country or in a town of less than 10,000 people
- D. Be unable to secure a loan from other sources
- E. Conduct an income producing project in a supervised program of work
- F. Be of good character

IV. The project must: (Transparencies 1, 2, and 3)

- A. Be part of an organized and supervised program of work

B. Be planned, managed, and operated by the student under the guidance and assistance from the FHA supervisor and the vocational agriculture instructor.

C. Produce sufficient income to repay the loan

D. Provide the student with practical business experience

E. Be approved by FHA supervisor, advisor, and parents

V. Types of youth loan programs:

A. Livestock Production

B. Crop Production

C. Repair Shop

D. Mobile machinery repair vans

E. Custom machinery

F. Roadside stands and many others

VI. Youth loans may be used for:

A. Purchasing livestock and farm equipment

B. Buying, renting, or repairing needed tools and equipment

C. Paying operating expenses for running the project

D. Buying supplies

VII. Size of loans for projects:

A. Depends on the kind of project
(Example: a 20 head cow-calf operation will need more finances than a 20 head swine finishing operation.)

B. Depends on what the FHA supervisor and instructor feels the student can adequately handle

VIII. Interest rate of youth loans

A. Interest rate for youth loans is determined each July 1 for the following year

B. When a loan is made the interest rate for that loan will not change

INFORMATION SHEET

IX. Security Agreement

A. The student must sign a promissary note making him personally and fully responsible for the debt

B. Loans will be secured by liens on products produced, livestock, equipment, and fixtures purchased with loan funds.

C. Supervisory account--

1. Funds from the loan are deposited at the borrowers' bank

2. Deposited as a joint account between borrower and the FHA local supervisor

3. Borrower is issued a checkbook

4. Each time the borrower purchases an item the check is co-signed by him and the local FHA Supervisor

5. Supervisory account is designed so that the FHA local supervisor can supervise the planned use of the funds

X. Loan Repayment

A. Repayment schedule will be worked out with the FHA supervisor

B. Payments will be determined by the type of project
Examples:
1. raising livestock and crops--loan can be paid when the produce is sold

2. repair shop or service operation--loan can be paid from the weekly or monthly earnings

XI. Kansas Youth Loan facts and figures, 1973-74 fiscal year

A. Total number of loans granted--385 loans

B. Total dollars loaned--$950,000

C. Average size loan--$2,500

1. Largest loan--$15,800

2. Smallest loan--$100

D. Age range of students holding loans--8-18 years

E. Common types of program projects in Kansas:

1. Cow-calf and bred heifer programs are the most common
2. Gilt and hog operation facilities
3. Crop production and machinery

Position 3

Ag. I - 113-C
FORM APPROVED.
BUDGET BUREAU NO. 40R-1071.9

United States Department of Agriculture
FARMERS HOME ADMINISTRATION

APPLICATION FOR FHA SERVICES

(Please Print or Write Plainly)

FOR COUNTY OFFICE USE ONLY
☐ W ☐ N ☐ O

1 NAME (FIRST) (MIDDLE) (LAST) | SOCIAL SECURITY NO. | NICKNAME OR KNOWN AS

2 WIFE'S NAME (FIRST) (MIDDLE) (MAIDEN) | SOCIAL SECURITY NO. | TELEPHONE NO.

3 COMPLETE ADDRESS (ROUTE, POST OFFICE, STATE, ZIP CODE, COUNTY)

4 AGES OF PERSONS IN HOUSEHOLD	HUSBAND	WIFE	SONS	DAUGHTERS	OTHERS

5. HIGHEST GRADE OF SCHOOL COMPLETED BY APPLICANT (CIRCLE APPROPRIATE YEAR)
ELEMENTARY:
1 2 3 4 5 6 7 8
HIGH SCHOOL:
1 2 3 4
COLLEGE:
1 2 3 4 5 6
OR MORE

6 ARE YOU A CITIZEN OF THE UNITED STATES? .. ☐ YES ☐ NO

IS YOUR WIFE A CITIZEN OF THE UNITED STATES? .... ☐ YES ☐ NO

7 ARE YOU A VETERAN ...... ☐ YES ☐ NO IF "YES" INDICATE SERVICE FROM ______________ TO ______________

8. MY FARM OR RESIDENCE IS LOCATED ______ MILES (DIRECTION)

FROM (TOWN) ON ROAD

IT ADJOINS THE PROPERTY OF:

9. ARE YOU FARMING OR RANCHING NOW? .... ☐ YES ☐ NO

IF NOT, WHEN DID YOU LAST OPERATE A FARM? __________ 19____ NUMBER OF YEARS EXPERIENCE OPERATING A FARM __________

10. DO YOU OWN OR RENT FARM YOU PLAN TO OPERATE? ...... ☐ OWN & RENT ☐ RENT ☐ OWN

DO YOU LIVE ON FARM YOU PLAN TO OPERATE? ☐ YES ☐ NO

IF YES, HOW LONG HAVE YOU LIVED ON THIS FARM? ______________ YRS.

	(LAST YR.)	(NEXT YR.)		(LAST YR.)	(NEXT YR.)
TOTAL ACRES OWNED	______	______	TOTAL ACRES RENTED	______	______
CROP ACRES OWNED	______	______	CROP ACRES RENTED	______	______

11. IF AN OWNER, WHEN DID YOU ACQUIRE THE LAND? ______________, 19____

HOW? (PURCHASED, INHERITED, ETC.)

FROM WHOM?

IF PURCHASED, GIVE PURCHASE PRICE .... $ ______________

12. IF YOU RENT OR PLAN TO RENT, GIVE NAME AND ADDRESS OF LANDLORD

TERMS AND LENGTH OF LEASE

ANNUAL CASH RENT PAID LAST YEAR .... $ ______________

VALUE OF SHARE OR OTHER NON-CASH RENT LAST YEAR $ ______________

13. NAME AND ADDRESS OF BANK WITH WHICH YOU LAST HAD A ☐ CHECKING OR SAVING ACCOUNT ☐ LOAN ACCOUNT

14. AMOUNT BORROWED FOR OPERATING PURPOSES OR BUSINESS LAST YEAR .... $ ______________

FROM WHOM?

15. HAVE YOU EVER OBTAINED A LOAN FROM FARMERS HOME ADMINISTRATION? .... ☐ YES ☐ NO

IF YES, WAS THE LOAN PAID IN FULL?..... ☐ YES ☐ NO

16. WHAT KIND OF NONFARM WORK DO YOU AND MEMBERS OF YOUR FAMILY DO?

______________________________ (HUSBAND)

______________________________ (WIFE)

______________________________ (OTHER)

17. NAME AND ADDRESS OF EMPLOYER(S)

______________________________ (HUSBAND)

______________________________ (WIFE)

NUMBER OF YEARS WITH EMPLOYER(S) AND INCOME LAST YR.
__________ YRS. $ ______________ (HUSBAND)
__________ YRS. $ ______________ (WIFE)

18. TOTAL CASH INCOME LAST YEAR:

LIVESTOCK AND LIVESTOCK PRODUCTS SOLD ... $ ______________

CROPS SOLD .... ______________

OTHER FARM INCOME .... ______________

NONFARM INCOME (SALARY, PENSIONS, DIVIDENDS, RENTS, ETC.) .... ______________

TOTAL $ ______________

19. TOTAL CASH EXPENSES LAST YEAR:

FAMILY LIVING .... $ ______________

FARM OPERATING .... ______________

NONFARM OPERATING .... ______________

PERSONAL, REAL ESTATE AND INCOME TAXES PAID .... $ ______________

OTHER (CAPITAL GOODS PURCHASED, DEBTS PAID, ETC.) .... ______________

TOTAL EXPENSE $ ______________

20. CASH VALUE OF FOOD PRODUCED FOR HOME USE LAST YEAR $ ______________

FHA 410-1 (Rev. 11-3-67)
TM 1

21. FINANCIAL STATEMENT AS OF DATE OF APPLICATION

Ag. I - 115-C

(Show property owned and debts owed by applicant and spouse)

LIST ALL PROPERTY OWNED

REAL ESTATE (LOCATION):	ACRES	VALUE
FARM		$
OTHER REAL ESTATE		
TOTAL REAL ESTATE		$
LIVESTOCK:	NO.	VALUE
LIVESTOCK HELD FOR SALE		$
DAIRY COWS		
BEEF COWS		
OTHER CATTLE		
BROOD SOWS AND GILTS		
OTHER HOGS		
EWES		
OTHER SHEEP		
POULTRY		
TOTAL LIVESTOCK		$
MACHINERY AND EQUIPMENT:		
AUTO $ TRUCK $		$
TRACTOR(S)		
OTHER FARM MACHINERY		
TOTAL MACHINERY AND EQUIPMENT		$
OTHER PERSONAL PROPERTY:	QUAN	VALUE
CROPS HELD FOR SALE		$
GROWING CROPS		
FEED		
SEED AND SUPPLIES		
HOUSEHOLD GOODS		
CASH ON HAND		
BONDS AND INVESTMENTS		
ACCTS OWED US—COLLECTIBLE		
TOTAL OTHER PERSONAL PROP.		$
TOTAL PROPERTY OWNED		$

LIST ALL DEBTS OWED

NAME AND ADDRESS OF CREDITOR	FINAL DUE DATE	INTEREST RATE	ANNUAL INSTAL	AMOUNT DELINQ	UNPAID BALANCE
LIENS ON REAL ESTATE:					
			$	$	$
TOTAL LIENS ON R. E.			$	$	$
LIENS ON CHATTELS AND CROPS:					
			$	$	$
TOTAL LIENS CHATTELS & CROPS			$	$	$
JUDGMENTS:					
TOTAL JUDGMENTS:			$	$	$

TAXES DUE: REAL ESTATE $__________ PERSONAL $__________

INCOME & SOCIAL SECURITY $__________ **TOTAL TAXES DUE** $

ALL OTHER DEBTS (DOCTOR, STORE, ETC., DESCRIBE): $

TOTAL OTHER DEBTS $

TOTAL ALL DEBTS $

22. FOR WHAT PURPOSE DO YOU NEED FARMERS HOME ADMINISTRATION SERVICES?

____

____

23. I am unable to provide the above items on my own account, and I am unable to secure the credit necessary for such items from other sources upon terms and conditions which I can reasonably fulfill. I CERTIFY that the statements made by me in this application are true, complete and correct to the best of my knowledge and belief, and are made in good faith to obtain a loan

DATE ____________________, 19____ ______________________________

(SIGNATURE OF APPLICANT)

24. TO BE COMPLETED BY COUNTY SUPERVISOR

TYPE OF LOAN APPLIED FOR: ☐ OL ☐ EM ☐ FO ☐ RH ☐ SW ☐ EO OTHER ____________ (SPECIFY)

CONDITION OF HOUSE ☐ 1 ☐ 2 ☐ 3

PLUMBING FACILITIES IN HOUSE ☐ 1 ☐ 2 ☐ 3

SYSTEM OF FARMING LAST YEAR: ______________________________

TM 1 (continued)

SAMPLE FORM

(Name of Youth Applicant) (Date)

(Address)

(Project Description)

$

(Proposed Loan Amount)

Recommendation of Parents:

As parents of the above mentioned applicant, we hereby recommend and approve of this proposed project and loan.

(Father)

(Mother)

Recommendation of Advisor:

As advisor to the above mentioned applicant, I hereby recommend and approve of this proposed project and loan. As advisor, I will make timely visits, for supervision purposes, as the need arises.

(Name)

(Title)

(NOTE: this is only a sample and may vary from county to county.)

Ag. I - 119-C

SAMPLE FORM

YOUTH ORGANIZATION PROJECT

Calendar Year__________

Name ____________________ Age __________ Address ____________________

Chapter or Club Name ____________________ Years in Club __________ Date ____________________

Description of project to be financed (Example--Sow-litter, 3 sows, feed out pigs) ____________________

	Plan	Actual
1. Estimated total income - - - - - - - - - -	$__________	$__________
2. Estimated total operating expenses - - -	$__________	$__________
3. Estimated annual net return - - - - - - -	$__________	$__________

Use the reverse side of this sheet to show breakdown of income and expenses. Use the reverse side to show any management practices recommended by the advisor.

* *

List below, items for which loan funds will be needed, by category:

1. Equipment (machinery, feeders, farrowing crates, etc.)
   Example--3 farrowing crates at $60.00 - - - $180.00
   A.
   B.
   C.
   D.
2. Livestock (sows, gilts, cows, bred heifers, etc.)
   Example--3 bred gilts at $120.00 - - - $360.00
   A.
   B.
   C.
   D.
3. Years operating expenses (feed, seed, fuel, fertilizer, etc.)
   Example--750 bushels corn at $1.40/bu. - - - $1050.00
   A.
   B.
   C.
   D.

Total amount of loan funds needed $______________

* *

Applicant Signature ____________________ Parent Signature ____________________ Advisor Signature ____________________

Planned FHA debt repayment this year:

Amount to be Paid __________ Dates __________ Source of Funds __________ Actual Paid __________

TM 3

(NOTE: This is only a sample form and may vary from county to county.)

FHA YOUTH LOAN PROGRAM
UNIT IV
TEST

1. Define the following:

   A. FHA--

   B. Promissory note--

   C. Lien--

   D. Security--

2. List five requirements to qualify for a FHA youth loan:

   A.

   B.

   C.

   D.

   E.

3. Name four enterprises in which youth loans can be used to make purchases.

   A.

   B.

   C.

   D.

4. What specific items can be purchased with money from youth loans?

   A.

   B.

   C.

   D.

5. List three ways loans are secured.

   A.

   B.

   C.

6. A. How is repayment determined for FHA youth loans?

B. Explain the two types of repayment plans.

1.

2.

FHA YOUTH LOAN PROGRAM
UNIT IV

ANSWERS TO TEST

1. Define the following:

   A. FHA--the Farmers Home Administration of the USDA channels credit to farmers, rural residents, and communities and helps borrowers gain maximum benefit from loans through counseling and technical assistance

   B. Promissory note--a written promise to pay on demand or at a fixed future time a certain sum of money to specific lender or lending institution

   C. Lien--a right of the lender or lending institution to control a charge against the property of a borrower until the charge is paid

   D. Security--a item of the lender or lending institution to control a charge against the property of a borrower until the charge is paid

2. Any five of the following:

   A. Citizen of the U.S.

   B. Under 21 years old

   C. Live in the open country or in a town of less than 10,000 people

   D. Unable to get a loan from other sources

   E. Conduct an income-producing project in a supervised program of work

3. Any four of the following

   A. Livestock production

   B. Crop production

   C. Repair shop

   D. Mobile machinery repair van

   E. Custom machinery

   F. Road-side stand

4.

   A. Purchasing livestock and farm equipment

   B. Buying, renting, or repairing needed tools and equipment

   C. Paying operating expenses for running the project

D. Buying supplies

5. A. Sign a promissory note

   B. Liens on products produced, livestock, equipment, and fixtures purchased with loan funds

   C. Supervisory accounts

6. A. Payment schedule will be determined by the type of project

   B. 1. Loans can be paid when the produce is sold

      2. Loans can be paid from weekly or monthly earnings

THE LIVESTOCK INDUSTRY
UNIT I

TERMINAL OBJECTIVES

After completion of Unit I, the student should be able to discuss the current trends in the livestock industry and its importance to agriculture and the economy. He should be able to match occupations associated with the livestock industry with the correct description. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with the livestock industry to their correct definitions.
2. Reproduce the basic production-distribution cycle.
3. Select from a list the four primary classes of livestock grown in Kansas.
4. Match the approximate number with the correct class of livestock in Kansas and the United States.
5. Reproduce a chart illustrating the trends of the livestock industry in Kansas.
6. Match occupations in the livestock industry with their descriptions.
7. Describe the impact that the beef cattle industry has made on Kansas agriculture.

THE LIVESTOCK INDUSTRY
UNIT I

SUGGESTED ACTIVITIES

Instructor:

1. Provide each student with objectives
2. Provide each student with information sheet
3. Make transparencies
4. Discuss terminal and specific objectives
   (NOTE: Objectives may be used as a pretest.)
5. Discuss information sheet
6. Give test

Student:

1. Read objectives
2. Study information sheet and take notes
3. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objective sheet
2. Information sheet
3. Transparency masters
   - TM 1--Swine in Kansas 1963-75
   - TM 2--Cattle and Calves in Kansas 1963-75
   - TM 3--Sheep in Kansas 1963-75
4. Test
5. Answers to test

References:

1. Annual Report-Kansas Agriculture, Kansas State Board of Agriculture, Topeka, Kansas, Robert R. Sanders, State Printer, 1975.

2. Hoover, Norman K. Handbook of Agricultural Occupations. Danville, Illinois: Interstate Printers and Publishers, Inc., 1963.

3. Krebs, Alfred H. Agriculture in our Lives. Danville, Illinois: Interstate Printers and Publishers, Inc., 1964.

4. Statistical Abstract of the United States. Washington, D.C.: United States Department of Commerce Publication, Bureau of Census, 1972.

5. Our Land and its Care. Washington, D.C.: National Plant Food Institute.

6. *Agriculture Chartbook, Outlook*. Dept. of Agriculture, Washington, D.C.: Government Printing Office, 1971.

7. Stone, Archie A. *Careers in Agriculture, Business, and Industry*. Danville, Illinois: Interstate Printers and Publishers, Inc., 1965.

8. Evans, Everett F. and Ray L. Donahue. *Exploring Agriculture*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1963.

9. 1973 Handbook of Agricultural Charts, Agricultural Handbook #455, USDA, Washington, D.C.

THE LIVESTOCK INDUSTRY
UNIT I

INFORMATION SHEET

I. Terms and definitions

A. Agricultural industry--Includes: (1) the farm industry which produces the commodities, (2) the industries which supply and service the farm industry, and (3) the industries which process and distribute to the consumer

B. Commodity--Products of agriculture such as beef, pork, and wheat

C. Consumer--Those who use the products of agriculture such as the housewife

D. Cycle--The regular changes in price and production of agricultural commodities

E. Distribution--The means by which agricultural products are made available to the consumer

F. Processing--The preparing of farm products for use (slaughtering, cutting, and packaging)

G. Production--The growing of agricultural products

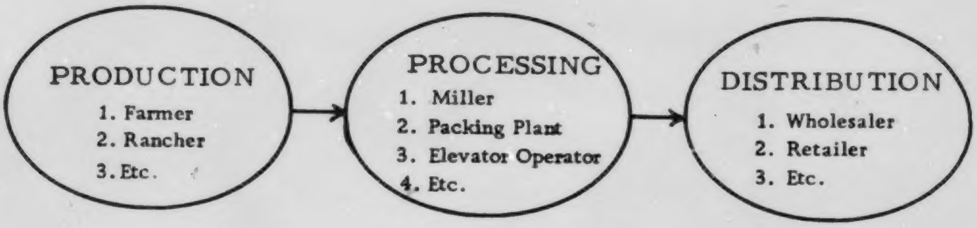
H. Trends--Direction of movement of a commodity in terms of production and prices (up,down, or steady)

I. Feeder animal--Animals that have been fattened on grass and are ready for the feedlot

J. Stocker animal--Animals that are to be placed on pasture for further growth

K. Market animal--An animal that has been fed to the acceptable market weight for that class; usually for slaughter
(NOTE: examples, cattle--1000-1200 lbs. swine--220-240 lbs.; lambs--100-120 lbs.)

II. Basic production-distribution cycle


PRODUCTION
1. Farmer
2. Rancher
3. Etc.
PROCESSING
1. Miller
2. Packing Plant
3. Elevator Operator
4. Etc.
DISTRIBUTION
1. Wholesaler
2. Retailer
3. Etc.

INFORMATION SHEET

III. Primary class of livestock in Kansas (1974)

- A. Beef cattle and calves--Number one in the state in rank and value of all principal crops and livestock
- B. Swine--Number four in rank and value of all principal crops and livestock
- C. Dairy cattle and products--Number five in the state compared to all other principal crops and livestock
- D. Sheep--Number ten in rank and value of all principal crops and livestock grown in Kansas

IV. Number of beef, sheep, swine, and dairy

	Kansas (1975)	U.S. (1974-75)
A. All cattle and calves	6,400,000	131,826,000
B. Beef cows	1,978,000	45,421,000
C. Sheep	200,000	14,538,000
D. Swine	1,750,000	55,062,000
E. Dairy	147,000	11,217,000
F. Poultry (not broilers)	3,346,000	382,793,000

V. Trend of the livestock industry in Kansas 1963-75 (Transparencies 1,2, and 3)

VI. Occupations in the livestock industry

- A. Farmer or rancher--Concerned with the initial production of products
- B. Farm or ranch hand--Works for the farmer or rancher and assists in the operation
- C. Farm or ranch foreman--Has the responsibility for the day-to-day work operations of a farm or ranch
- D. Feedlot manager--Has charge of feeding cattle for market
- E. Feedlot employee--Works in one of the departments of the feedlot system such as truck driver or bookkeeper

INFORMATION SHEET

F. Auctioneer-Sells livestock at the markets

G. Artificial inseminator-Breeds livestock artificially

(NOTE: The artificial inseminator may be an employee of a breeder's association.)

H. Feed store manager-Supplies feed, seed, and equipment to farmers

I. Feed store employee--Assists in operating some phase of the feed store such as salesman or deliveryman

J. Feed mill operator--Operates a feed mill for a feedlot or feed store

K. Cattle buyer--Buys cattle for farmers, feeders, and packing plants

L. Commission man--Sells livestock for the farmer or rancher

VII. Main out-of-state feeder cattle buyers

A. Oklahoma

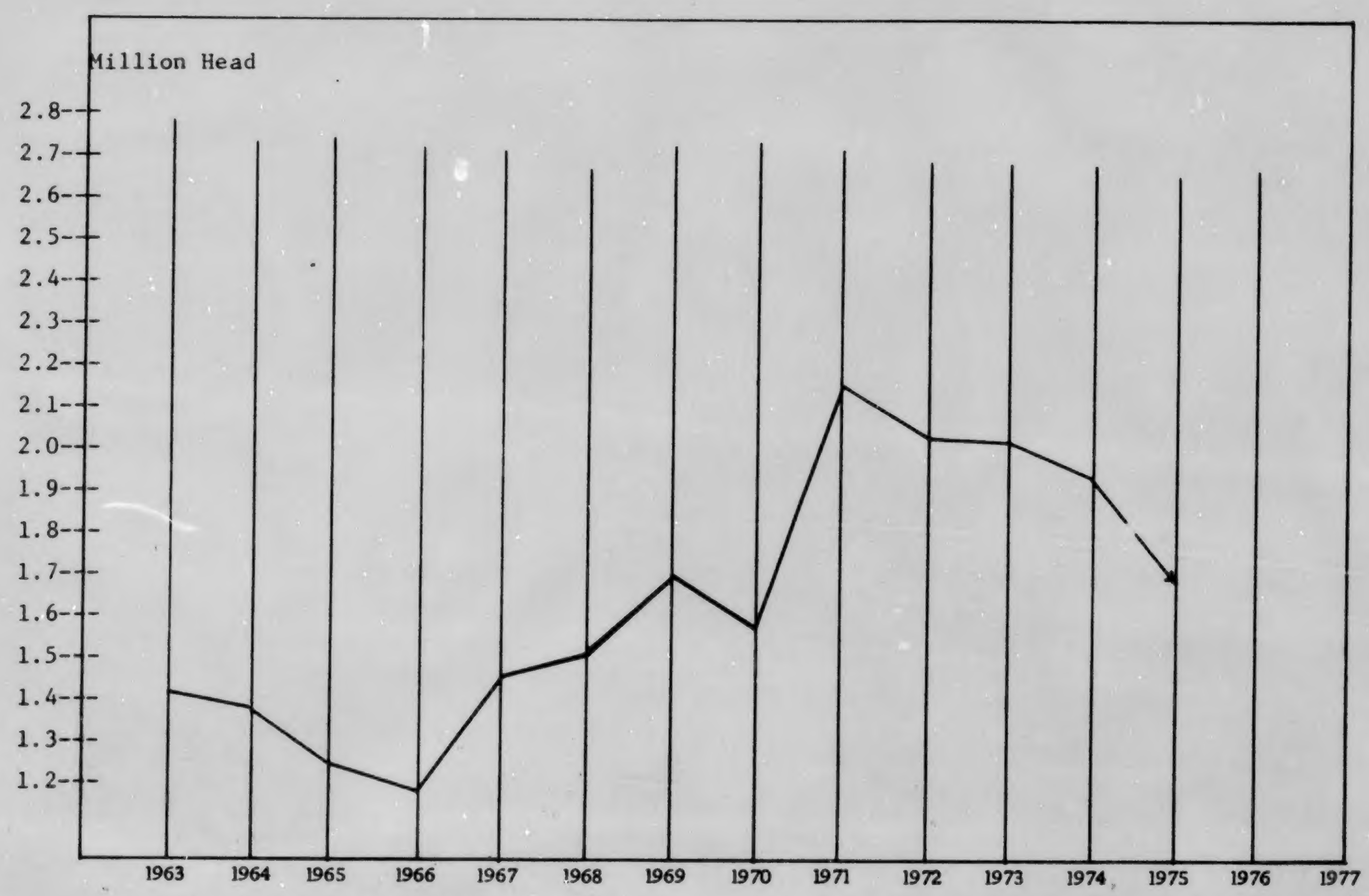
B. Texas

C. Missouri

D. Colorado

E. Alabama

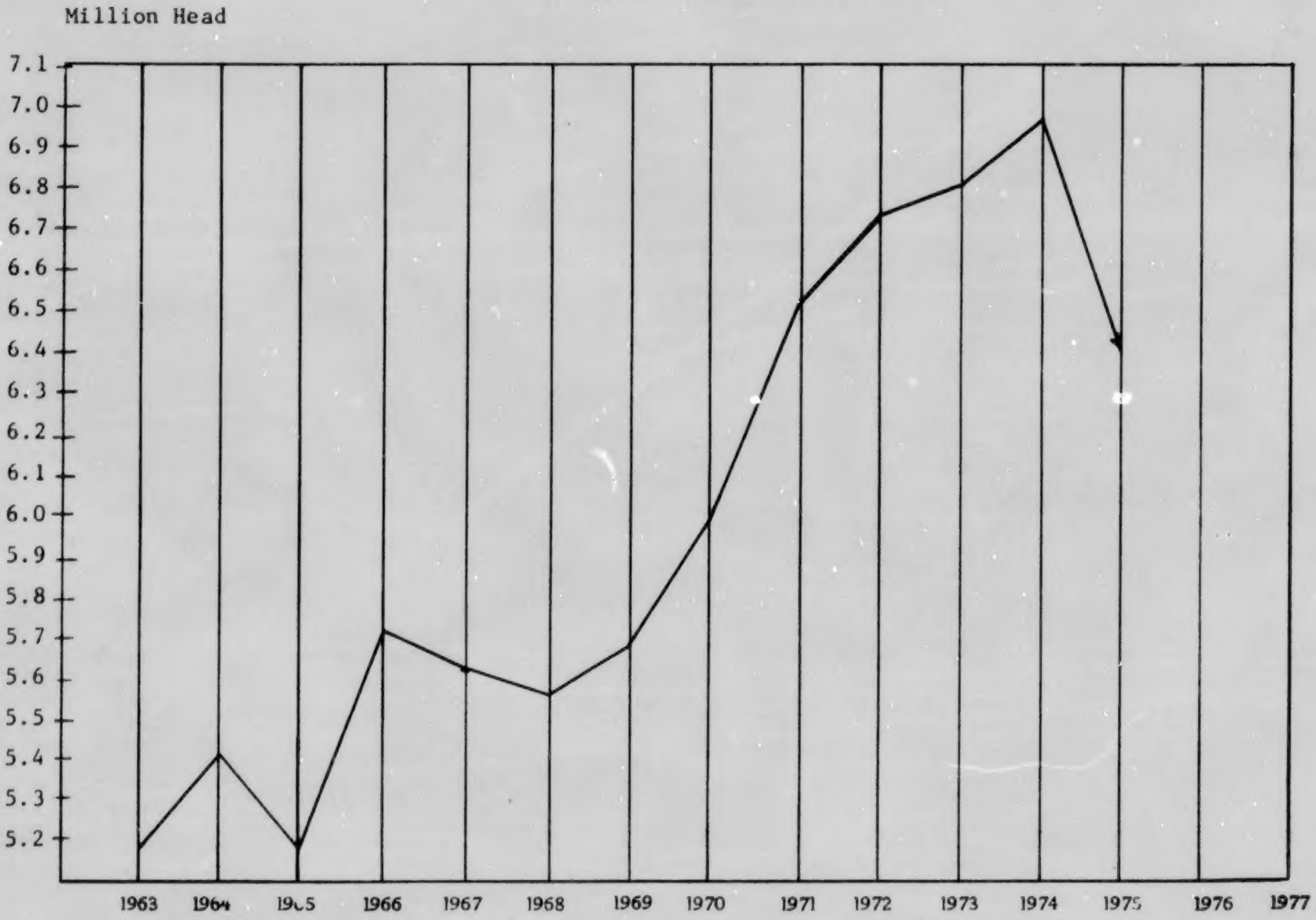
SWINE IN KANSAS 1963-75



TM 1

Ag. I - 9-D

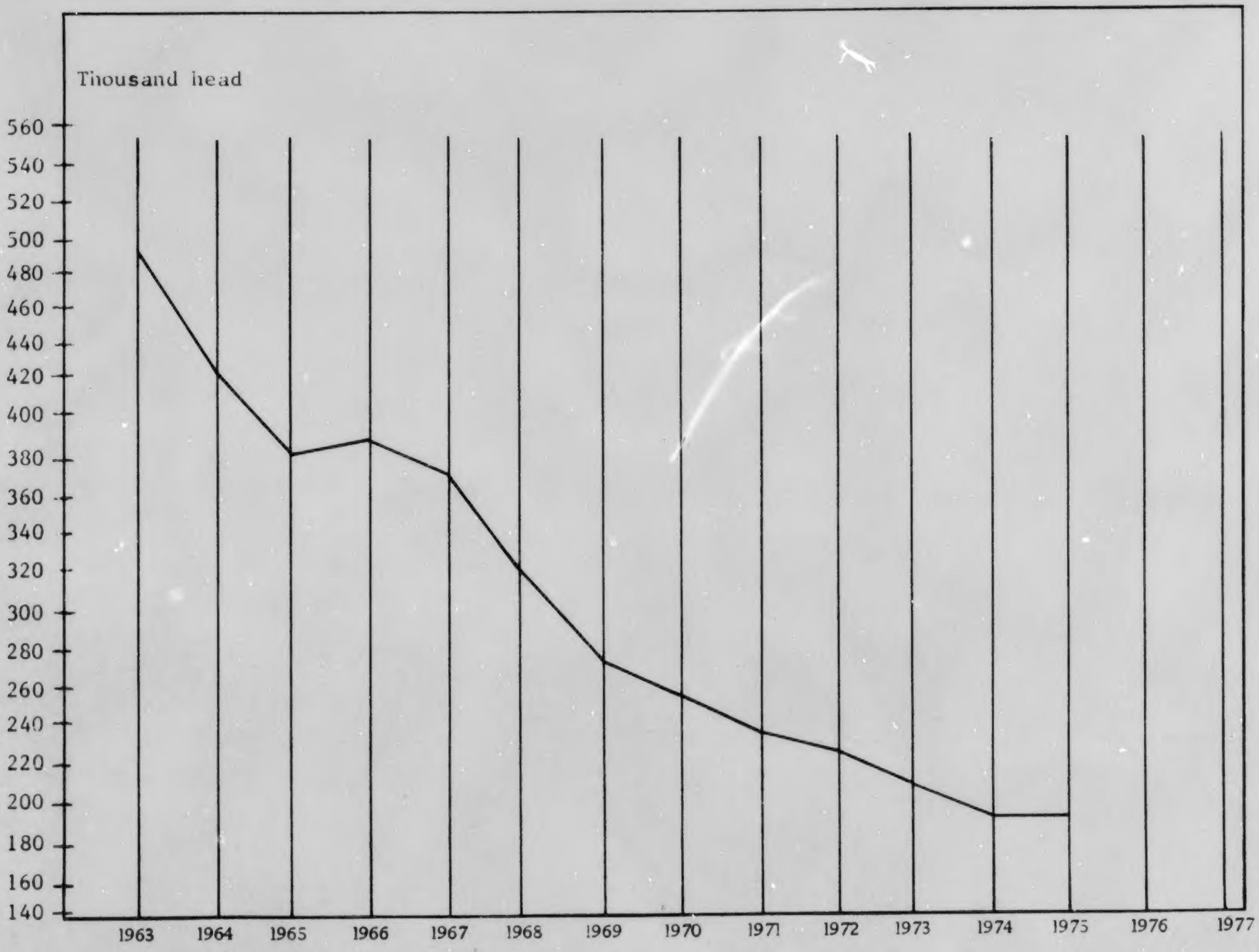
CATTLE AND CALVES IN KANSAS 1963-75



TM 2

Ag. I - 11-D

SHEEP IN KANSAS 1963-75



THE LIVESTOCK INDUSTRY
UNIT I

TEST

1. Match the terms on the right with its correct definition.

_____a. The regular changes in price and production of agricultural commodities

_____b. The growing of agricultural products

_____c. Products of agriculture such as beef, pork, and wheat

_____d. Those who use the products of agriculture such as the housewife

_____e. Cattle that are to be placed on pasture for further growth

_____f. Direction of movement of a commodity in terms of production and prices (up, down, or steady)

_____g. Includes: (1) the farm industry which produces the commodities, (2) the industries which supply and service the farm industry, and (3) the industries which process and distribute to the consumer

_____h. The means by which agricultural products are made available to the consumer

_____i. Cattle that have been fattened on grass and are ready for the feedlot

_____j. The preparing of farm products for use (slaughtering, cutting, and packaging)

1. Agricultural Industry
2. Commodity
3. Consumer
4. Cycle
5. Distribution
6. Processing
7. Production
8. Trends
9. Feeder cattle
10. Stocker cattle

2. Reproduce the basic production-distribution cycle.

3. Place an "X" in front of the four primary classes of livestock raised in Kansas.

_____a. Poultry

_____b. Cattle and calves

_____c. Mules

_____d. Dairy

_____e. Swine

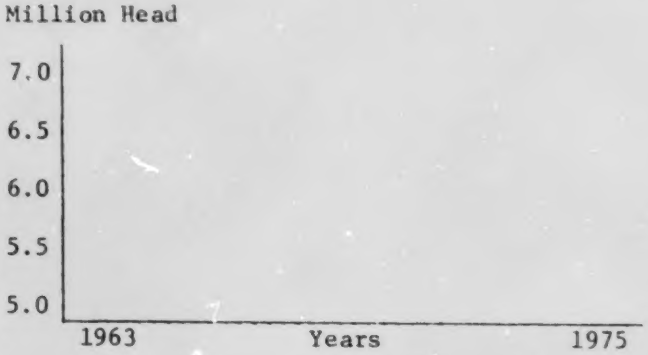
_____f. Sheep

_____g. Horses

4. Match the approximate number with the correct class of livestock in Kansas

_____a. Cattle and calves	1. 147,000
_____b. Swine	2. 200,000
_____c. Sheep	3. 1,750,000
_____d. Dairy	4. 6,400,000

5. Draw a chart showing the general trend of the beef industry in Kansas.



6. Match the occupation in the livestock industry with its correct description.

_____a. Concerned with the initial production of products

_____b. Has charge of feeding cattle for market

_____c. Sells livestock at the markets

_____d. Supplies feed, seed, and equipment to farmers

_____e. Operates a feed mill for a feedlot or feed store

_____f. Sells livestock for the farmer or rancher

_____g. Works for the farmer or rancher and assists in the operation

_____h. Has the responsibiltiy for the day-to-day work operations of a farm or ranch

1. Farmer or rancher
2. Farm or ranch hand
3. Farm or ranch foreman
4. Feedlot manager
5. Feedlot employee
6. Auctioneer
7. Artificial inseminator
8. Feed store manager
9. Feed store employee
10. Feed mill operator
11. Cattle buyer
12. Commission man

_____i. Works in one of the departments of the feedlot system such as truck driver or bookkeeper

_____j. Breeds livestock artificially

_____k. Assist in operating some phase of the feed store, such as salesman or deliveryman

_____l. Buys cattle for farmers, feeders, and packing plants

7. Name four of the main out-of-state feeder cattle buyers

a.

b.

c.

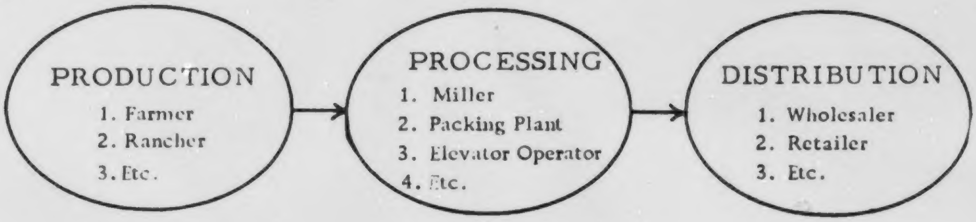
d.

THE LIVESTOCK INDUSTRY
UNIT I

ANSWERS TO TEST

1. a. 4
   b. 7
   c. 2
   d. 3
   e. 10
   f. 8
   g. 1
   h. 5
   i. 9
   j. 6

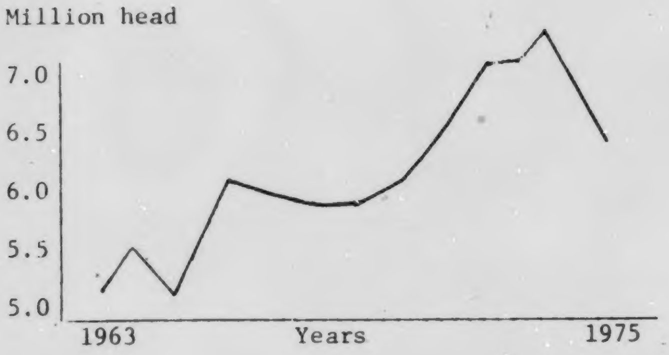
2.


PRODUCTION
1. Farmer
2. Rancher
3. Etc.
PROCESSING
1. Miller
2. Packing Plant
3. Elevator Operator
4. Etc.
DISTRIBUTION
1. Wholesaler
2. Retailer
3. Etc.

3. b,d,e,f

4. a. 4
   b. 3
   c. 2
   d. 1

5.



6. a. 1
   b. 4
   c. 6
   d. 8
   e. 10
   f. 12
   g. 2
   h. 3
   i. 5
   j. 7
   k. 9
   l. 11

7. Any four of the following
   a. Oklahoma
   b. Texas
   c Missouri
   d Colorado
   e. Alabama

BREEDS OF LIVESTOCK
UNIT II

TERMINAL OBJECTIVES

After completion of Unit II, the student should be able to describe the various breeds of livestock according to origin, characteristics, and breed associations. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with breeds of livestock to the correct definitions.
2. Describe the major breeds of beef cattle including origin, characteristics, and breed association.
3. Describe the major breeds of swine including origin, characteristics, and breed association.
4. Describe the major breeds of sheep including origin, characteristics, and breed association.
5. Describe the major breeds of dairy cattle including origin, characteristics, and breed association.
6. Describe the major breeds of horses including origin and characteristics.
7. List prominent breeders of livestock in the local area.

BREEDS OF LIVESTOCK
UNIT II

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objectives
2. Provide students with information sheet
3. Discuss terminal and specific objectives
4. Discuss information sheet
5. Give test

Students:

1. Read objectives
2. Study information sheet
3. Write to breed associations for information and present it to the class
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheet
3. Test
4. Answers to test

References:

1. Instructional Materials for Vocational Agriculture I. College Station, Texas: Teaching Materials Center, Agricultural Education Dept., Texas A & M University.

2. Evans, Everett F. and Roy L. Donahue. Exploring Agriculture. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1963

3. Ensminger, M. E. The Stockman's Handbook. Danville, Illinois: Interstate Printers and Publishers, Inc., 1962

4. Bundy, Clarence E. and Ronald V. Diggins. Dairy Production. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1969.

5. Bundy, Clarence E. and Ronald V. Diggins. Beef Production Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1971.

6. Bundy, Clarence E. and Ronald V. Diggins. Livestock and Poultry Production. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1961.

7. Briggs, Hilton M. Modern Breeds of Livestock. New York: Macmillan Co., 1967.

BREEDS OF LIVESTOCK
UNIT II

INFORMATION SHEET

I. Terms and definitions

A. Crossbred breeder--A breeder of livestock producing animals that are the offspring of animals of two different purebreds

B. Purebred breeder--A breeder of animals whose ancestors are all of the same breed (may or may not be pedigreed)

C. Artificial breeding or insemination--Depositing the male semen into the female reproductive tract by artificial means

D. Bloodline--A family or family line of breeding

E. Boar--A mature uncastrated male swine

F. Certified meat sire--Sire of several animals meeting the requirements for certification as established by the breed association

G. Buck or ram--A mature male goat or sheep

H. Bull--The male of the bovine species (cattle)

I. Calf--An animal of the bovine species under one year of age and of any sex

J. Castration--Removal of the testicles of a male animal

K. Commercial breeder--A breeder of animals for the commercial markets

L. Cow--A female of the bovine species that shows evidence of having produced one or more calves

M. Ewe--A female sheep

N. Full-blood--A purebred animal

O. Get--The offspring of any animal, usually the sire

P. Gilt--A young female swine that has not reproduced

Q. Heifer--A female bovine that has not borne an offspring

R. Springer--A cow showing signs of pregnancy

S. Heiferette--A cow that has produced an offspring but retained the appearance of a heifer

INFORMATION SHEET

T. Mutton--A sheep or goat over one year of age that was castrated while a lamb

U. Pedigree--A table presenting a line of ancestors for an animal

V. Sow--A mature female swine that has produced a litter of pigs

W. Wether--A castrated male lamb under one year of age

X. Stag--A male animal castrated after reaching sexual maturity

Y. Barrow--A male swine that has been castrated at an early age

Z. Steer--A male bovine animal that has been castrated at an early age

aa. Freemartin--The female twin of a fraternal set of twins which cannot reproduce

bb. Mare--A sexually mature female horse showing evidence of having one or more foals

cc. Foal--The offspring of a mature female equine; either sex

dd. Gelding--A castrated male horse usually over two years of age

ee. Stallion or stud--A sexually mature uncastrated male horse

ff. Filly--A sexually immature female horse over one year of age

II. Major breeds of beef cattle(Instructor should stress the most common)

Breed	Country of origin	Mature size Bull	Cow	Color Horned (H) or polled (P)
Aberdeen Angus	Scotland	1700	1200	Black P
Barzona	Arizona, USA	1800	1200	Dark red H
Beefmaster	Texas, USA	2200	1750	Red H
Blonde d'Aquitaine	France	2200	1500	Fawn H
Brahman	India	1500	1100	Gray-white H with hump
Brangus	Oklahoma, USA	1500	1300	Black, slight crest over back P
Charolais	France	2400	1600	White or cream H & P

Breed	Country of origin	Mature size Bull	Cow	Color Horned (H) or polled (P)
Devon	England	2100	1500	Red H
Galloway	Scotland	1500	1300	Black, long curly hair P
Gelbvieh	Germany	2300	1500	Reddish-fold H
Hereford	England	1900	1300	Red white face H
Limousin	France	2100	1300	Reddish-gold H
Maine Anjou	France	2600	1800	Red with white spots or roan H
Marchigiana	Italy	2700	1700	Gray, dark skin H
Murray Grey	Australia	1900	1300	Smoky gray P
Normade	France	2500	1600	Black with white markings H
Norwegian Red	Norway	2400	1300	Red with white markings H
Pinzgauer	Austria	2100	1400	Brown or black with white topline and underside H
Polled Hereford	Iowa USA	2100	1400	Red white face P
Red Angus	Scotland	1800	1300	Solid red P
Red Poll	England	1800	1150	Red P
Santa Gertrudis	Texas, USA	1700	1200	Dark cherry red H
Scotch Highland	Scotland	1600	1100	Brown, black, or red H
Simmental	Switzerland	2400	1600	Cream to red with white face and spots H
Shorthorn	England	1700	1200	Red, roan, or white H & P
Welsh Black	England	1900	1100	Black H

INFORMATION SHEET

III. Major breeds of swine (Instructor should stress the most common)

   A. Duroc

      1. Origin--New England States (Developed in Corn Belt)

      2. Breed association--United Duroc Record Association, 239 North Monroe Street, Peoria, Illinois

      3. Characteristics--Red (may vary from light golden to very dark red color), medium length and slightly dished face, ears are drooped

   B. Hampshire

      1. Origin--Kentucky

      2. Breed association--Hampshire Swine Registry, 1111 Main Street, Peoria, Illinois

      3. Characteristics--Black with white belt encircling the shoulders, white front feet and legs, erect ears

   C. Poland China

      1. Origin--Ohio

      2. Breed association--Poland China Record Association, 501 Losey Street, Galesburg, Illinois

      3. Characteristics--Black, six white points (feet, nose, tail), drooping ears

   D. Spotted Poland China

      1. Origin--Ohio

      2. Breed association--National Spotted Poland China Record, 8180 Rosemeade Lane, Indianapolis, Indiana

      3. Characteristics--Spotted, fifty percent white and fifty percent black, drooping ears

   E. Chester White

      1. Origin--Pennsylvania

      2. Breed association--Chester White Swine Record Association, Rochester, Indiana

      3. Characteristics--White, drooping ears

INFORMATION SHEET

F. Yorkshire

1. Origin--England
2. Breed association--American Yorkshire Club, Lafayette, Indiana
3. Characteristics--White, erect ears

G. Berkshire

1. Origin--England
2. Breed association--American Berkshire Association, 610 West Monroe Street, Springfield, Illinois
3. Characteristics--Black, six white points (feet, face, tail), erect ears, short snout

(NOTE: Several new breeds have been imported and/or developed such as Landrace, Tamworth, and Hereford. They have not gained the popularity as the breeds listed. Many have been developed by crossbreeding such as Minnesota #1, Minnesota #2, Montana #1, Palouse, and the Beltsville lines.)

IV. Major breeds of sheep (Instructor should stress the most common)

Classification	Breed	Country of Origin	Approx. date of Origin	Color Traits	Horns
Fine wool	Rambouillet	France	1786	White	Rams only
	Merino	Spain	Early	White	Rams only
	Debouillet	USA	1920	White	Rams only
Meat, Med. wool	Suffolk	England	Early 19th century	Black face & legs	Polled
	Hampshire	England	Early 19th century	Black face & legs	Polled
	Shropshire	England	1860	Black face & legs	Polled
	Southdown	England	Late 18th century	Brown face & legs	Polled
	Dorset	England	About 1815	White face & legs	Polled & Horne
	Chevoit	England	End of 18th century	White face & legs	Polled
	Oxford	England	1836	Brown face & legs	Polled
	Tunis	N. Africa	Ancient	Red or tan face	Polled
	Corriedale	New Zealand	1880-1910	White	Polled
	Columbia	USA	1912	White	Polled
	Panama	USA	1912	White	Polled
	Targhee	USA	1927	White	Polled
	Romeldale	USA	1915	White	Polled
	Montadale	USA	1933 on	White	Polled
Long-wool	Romney	England	Early	White	Polled
	Lincoln	England	Early	White	Polled
	Leicester	England	1755-90	White	Polled
	Cotswold	England	Early	White	Polled
Carpet-wool mixed wool fur	Scottish Blackface	Scotland	Early	Black face & legs	Rams & Ewes
	Navajo	USA	Early	Variable	Rams & Ewes Polled & Horne
	Karakul	Asia	Ancient	Black, brown	Rams only

INFORMATION SHEET

V. Major breeds of dairy cattle

- A. Holstein
    1. Origin--Holland
    2. Breed association--Holstein-Friesian Association of America, Box 808, Brattleboro, Vermont 05301
    3. Characteristics--Black and white and white switch; adult weight: female in milk 1500#, bull 2000#; leads other breeds in milk production; butterfat test 3.5%
- B. Guernsey
    1. Origin--Guernsey Island (coast of France)
    2. Breed association--American Guernsey Cattle Club, Peterborough, New Hampshire 03458
    3. Characteristics--Light fawn to almost red; white markings on face, legs, switch, and flanks; adult weight: female in milk 1100#, bulls 1700#; milk production less than Holstein; butter fat test 5%
- C. Jersey
    1. Origin--Jersey Island (English Channel)
    2. Breed association--American Jersey Cattle Club, 1521 East Brood Street, Columbus, Ohio 43205
    3. Characteristics--Light fawn to black,white spotted to solid; adult weight: female in milk 1000#, bulls 1500#; butterfat test 5.3%
- D. Ayrshire
    1. Origin--Scotland
    2. Breed association--Ayrshire Breeders' Association, Brandon, Vermont 05733
    3. Characteristics--Red with white markings or white with red markings; adult weight: female in milk 1250#, bulls 1800#; production lower than other breeds; butterfat test 4.0%
- E. Brown Swiss
    1. Origin--Switzerland

INFORMATION SHEET

2. Breed association--Brown Swiss Cattle Breeders' Association of America, Box 1019, Beloit, Wisconsin 53511

3. Characteristics--Light fawn to black; black nose, tongue, switch, and horn tips; largest, most rugged breed; adult weight: female in milk 1400#, bulls 1900#; butterfat test 4.0%

   (NOTE: Several breeds are considered to be dual-purpose (beef and dairy) breeds. They are Milking Shorthorn, Red Poll, and Devon.
   In milk means normal condition after cow has been lactating 3 to 6 months)

VI. Major Breeds of Horses

Breed	Origin	Characteristics
Appaloosa	Introduced to Mexico by Spanish explorers	Combination of colors and spots, eye encircled by white, mottled skin, hoofs black & white; weight 1000 to 1200 lbs.
Arabian	Arabia	Colors: Bay, gray, and chestnut are predominant, dished face, predominant neck; weight 850-1100 lbs.
Morgan	Eastern USA	Colors: Bay, brown, black, and chestnut with white markings predominant neck and barrel; weight 800-1200 lbs.
Palomino	Spain	Golden & white, silver or ivory mane and tail; weight 1000 to 1200 lbs.
Pinto	Spain	Half color or colors (bay, brown, black) and half white spots ranging from 2 to 12 inches across.
Quarter Horse	Texas	Chestnut, sorrel, bay, dun, palomino, black, brown, roan; weight 1050-1300 lbs.
Shetland Pony	Shetland Islands	All horse colors, height 10-11 hands; weight 300-600 lbs.
Thoroughbred	England	Bay, brown, chestnut, sorrel, black, and gray; Height 15 to 17 hands; weight 900-1400 lbs.

VII. Local prominent breeders of livestock (to be completed by instructor)

a.

b.

c.

BREEDS OF LIVESTOCK
UNIT II

TEST

1. Match the terms on the right with the correct definition.

_____a. A family or family line of breeding

_____b. The male of the bovine species (cattle)

_____c. Removal of the testicles of a male animal

_____d. A breeder of animals for the commercial markets

_____e. Depositing the male semen into the female reproductive tract by artificial means

_____f. A mature male goat or sheep

_____g. An animal of the bovine species under one year of age and of any sex

_____h. A female sheep

_____i. A breeder of animals whose ancestors are all of the same breed (may or may not be pedigreed)

_____j. Sire of several animals meeting the requirements for certification as established by the breed association

_____k. A young female swine that has not reproduced

_____l. A table presenting a line of ancestors for an animal

_____m. A male bovine animal that has been castrated at an early age

1. Crossbred breeder
2. Purebred breeder
3. Artificial breeding or insemination
4. Bloodline
5. Boar
6. Certified meat sire
7. Buck or ram
8. Bull
9. Calf
10. Castration
11. Commercial breeder
12. Cow
13. Freemartin
14. Ewe
15. Full-blood
16. Get
17. Gilt
18. Mare
19. Heifer
20. Springer
21. Heiferette
22. Foal

_____n. A breeder of livestock producing animals that are the offspring of animals of two different purebreds

_____o. A mature uncastrated male swine

_____p. The offspring of any animal, usually the sire

_____q. A mature female swine that has produced a litter of pigs

_____r. A male swine that has been castrated at an early age

_____s. A female of the bovine species that shows evidence of having produced one or more calves

_____t. A sheep or goat over one year of age that was castrated while a lamb

_____u. A male bovine animal castrated after reaching sexual maturity

_____v. A purebred animal

_____w. A cow that has produced an offspring but retained the appearance of a heifer

_____x. A castrated male lamb under one year of age

_____y. A cow showing signs of pregnancy

_____z. A female bovine that has not borne an offspring

_____aa. A sexually immature female horse over one year of age

_____bb. The offspring of a mature female equine; either sex

_____cc. The female twin of a fraternal set of twins which cannot reproduce

23. Mutton
24. Pedigree
25. Sow
26. Gelding
27. Wether
28. Stallion or stud
29. Stag
30. Barrow
31. Steer
32. Filly

_____dd. A sexually mature uncastrated male horse

_____ee. A sexually mature female horse showing evidence of having one or more foals

_____ff. A castrated male horse usually over two years of age

2. Describe the major breeds of swine given below by including origin, characteristics, and breed association.

	Breed	Origin	Characteristics	Breed Association
a.	Hampshire			
b.	Duroc			
c.	Berkshire			
d.	Chester White			
e.	Yorkshire			

3. Describe the major breeds of beef cattle given below by including origin, characteristics (color, horned or polled), and approximate mature weight

Breed	Origin	Characteristics	Approximate weight	
			Bull	Cow
a. Hereford				
b. Charolais				
c. Shorthorn				
d. Aberdeen Angus				

4. Describe the major breeds of sheep given below by including origin, characteristics (color traits and horns), and type of wool.

Breed	Origin	Characteristics	Type of wool
a. Hampshire			
b. Suffolk			
c. Dorset			
d. Rambouillet			

5. Describe the major breeds of dairy cattle given below by including origin, characteristics, and breed association.

	Breed	Origin	Characteristics	Breed Association
a.	Holstein			
b.	Jersey			
c.	Aryshire			

VI. Describe the major breeds of horses given below by, including origin, breed and characteristics (colors, markings & weight)

Breed	Origin	Characteristics
a. Appaloosa		
b. Quarter Horse		
c. Thoroughbred		

VII. List prominent breeders of livestock in your local area.

BREEDS OF LIVESTOCK
UNIT II

ANSWERS TO TEST

1.
- a. 4
- b. 8
- c. 10
- d. 11
- e. 3
- f. 7
- g. 9
- h. 14
- i. 2
- j. 6
- k. 17
- l. 24
- m. 31
- n. 1
- o. 5
- p. 16
- q. 25
- r. 30
- s. 12
- t. 23
- u. 29
- v. 15
- w. 21
- x. 27
- y. 20
- z. 19
- aa. 32
- bb. 22
- cc. 13
- dd. 28
- ee. 18
- ff. 26

2.	Breed	Origin	Characteristics	Breed Association
a.	Hampshire	Kentucky	Black with white belt around shoulders, white front feet and legs, erect ears	Hampshire Swine Registry
b.	Duroc	New England States	Red (may vary from light to golden to dark red color), medium length and slightly dished face, ears are drooped	United Duroc Record Association
c.	Berkshire	England	Black, six white points, short snout, erect ears	American Berkshire Association
d.	Chester White	Penn.	White, drooping ears	Chester White Swine Record Association
e.	Yorkshire	England	White, erect ears	American Yorkshire Club

3.	Breed	Origin	Characteristics	Approximate weight Bull Cow
a.	Hereford	England	Red with white face, horned	1900--Bull 1300--Cow
b.	Charolais	France	White to cream, horned or polled	2400--Bull 1600--Cow
c.	Shorthorn	England	Red, roan, or white, horned or polled	1700--Bull 1200--Cow
d.	Aberdeen Angus	Scotland	Black, polled	1700--Bull 1200--Cow

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4.	Breed	Origin	Characteristics	Type of wool
a.	Hampshire	England	Polled, black face, and legs	Medium
b.	Suffolk	England	Polled, black face, and legs	Medium
c.	Dorset	England	Horned or polled; white face and legs	Medium
d.	Rambouillet	France	White, ewes polled, rams polled, or horned	Fine

5.	Breed	Origin	Characteristics	Breed Association
a.	Holstein	Holland	Black and white and white switch; adult weight: female in milk 1500#, bulls 2000#; leads all breeds in milk production; butterfat test 3.5%	Holstein-Friesian Association of America
b.	Jersey	Jersey Island	Light fawn to black, white spotted to solid; adult weight: female in milk 1000#, bulls 1500#; butterfat test 5.3%	American Jersey Cattle Club
c.	Aryshire	Scotland	Red with white markings or white with red markings; adult weight: female in milk 1250#, bulls 1800#, production less than other breeds; butterfat test 4.0%	Aryshire Breeders' Association

VI.	Breed	Origin	Characteristics
a.	Appaloosa	Introduced to Mexico by Spanish explorers	Combination of colors and spots, eye encircled by white, mottled skin hoofs black & white; weight 1000-1200 lbs.
b.	Quarter Horse	Texas	Chestnut, sorrel, bay, dun, palomino, black, & roan; weight 1050-1300 lbs.
c.	Thoroughbred	England	Bay, brown, chestnut, sorrel, black & gray; weight 900-1400 lbs.

VII. To be completed by instructor

LIVESTOCK SELECTION
UNIT III

TERMINAL OBJECTIVES

After completion of Unit III, the student should be able to identify the parts of beef, sheep, swine, and dairy animals and the wholesale cuts of a carcass for pork, lamb, and beef. He should also be able to select desirable livestock adaptable to his home farm and community and present a set of reasons for placing a class of animals. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with livestock selection to the correct definition.
2. List the three steps in the livestock selection process.
3. Identify the parts of beef, swine, sheep, dairy, and horse animals.
4. Identify desirable and undesirable beef, sheep, swine, and dairy animals.
5. Identify the wholesale cuts of beef, pork, and lamb.
6. Match approximate percentage of yield of wholesale cuts to that cut on a carcass for beef, pork, and lamb.
7. Write ten comparative advantage terms and ten criticism terms used in livestock selection.
8. Present a set of reasons for livestock either written or orally.

LIVESTOCK SELECTION
UNIT III

SUGGESTED ACTIVITIES

Instructor:

1. Provide each student with objective sheet
2. Provide each student with information sheet
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information sheet
6. Give test

(NOTE: Instructor may want to secure picture judging sets and/or slides from the Curriculum and Instructional Materials Center, State Department of Vocational and Technical Education, Stillwater, Oklahoma, for students to practice judging.)

Students:

1. Read objectives
2. Study information sheet and take notes
3. Demonstrate to the instructor the ability to select animals by using picture judging sets or by taking field trip.
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheet
3. Transparency masters
    - TM 1--Parts of a Beef Animal
    - TM 2--Parts of a Swine
    - TM 3--Parts of a Sheep
    - TM 4--Parts of a Dairy Cow
    - TM 5--Parts of a Horse
    - TM 6--Desirable and Undesirable Beef Animals (Side View)
    - TM 7--Desirable and Undesirable Beef Animals (Rear View)
    - TM 8--Desirable and Undesirable Barrows (Side View)
    - TM 9--Desirable and Undesirable Lambs (Side View)
    - TM 10--Desirable and Undesirable Dairy Cows (Side View)
    - TM 11--Desirable and Undesirable Dairy Cows (Body Capacity and Udder and Rear Attachment)
    - TM 12--Wholesale Cuts of Beef
    - TM 13--Wholesale Cuts of Pork
    - TM 14--Wholesale Cuts of Lamb
    - TM 15--Approximate Yield Percentage of a Beef Carcass
    - TM 16--Approximate Yield Percentage of a Swine Carcass
    - TM 17--Approximate Yield Percentage of a Lamb Carcass
4. Test
5. Answers to test

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LIVESTOCK SELECTION
UNIT III

INFORMATION SHEET

I. Terms and definitions

A. Type--General term commonly defined as a combination of characteristics which make an animal most useful for a specific purpose

(NOTE: Type is determined by the general form or shape of an animal.)

B. Balance of symmetry--Proper proportions and blending of parts

C. Meatiness or muscling--High proportion of volume in the areas of the high priced cuts

D. Quality--Overall smoothness, blending of shoulders, and refinement of head and bone

E. Trimness--Freedom of excess finish or fat

F. Tight-framed--Ability of an animal to "hold itself together" as indicated by strength of top, tightness of shoulders, and squareness of feet and leg placement

G. Soundness--Quality of being correct on the feet and legs as opposed to unsound

(NOTE: This is used primarily with breeding stock.)

H. Constitution--Evidence of vigor or "doing ability" denoted by depth and fullness of heart, spring or ribs, and width of chest floor, and substance of bone

I. Growthiness--Condition of having size and weight for age

J. Scale--Size of the animal as determined by skeletal structure

(NOTE: This should be independent of weight.)

K. Ruggedness--Quality of having large bones and frame

L. Broodiness--Combination of characteristics which indicate the female will be a good mother

(NOTE: This is used only with breeding stock.)

M. Breed character--Traits which denote one breed from another

(NOTE: Refers to characteristics of head, such as shape, length and dish of face, width of muzzle, shape of poll, set of ear, color markings and wool covering in sheep.)

INFORMATION SHEET

N. Sex character (breeding stock only)

1. Femininity--Traits distinguishing a female from a male

(NOTE: Femininity is indicated by refinement of head, neck, and shoulders.)

2. Masculinity--Traits distinguishing a male from a female

(NOTE: Masculinity is indicated by strength of jaw and muzzle, boldness and massiveness of the head, crest, thickness of neck, and overall development of forequarters.)

II. Steps in the livestock selection process

A. Know the parts of the live animal

B. Know the wholesale cuts of the animal

C. Know what an ideal animal looks like

III. Parts of the beef, swine, sheep, and dairy animals

A. Beef (Transparency 1)

1. Poll
2. Neck
3. Crops
4. Back
5. Loin
6. Hooks
7. Rump
8. Tail head
9. Quarter
10. Stifle
11. Hock
12. Shank (cannon bone)
13. Hoof
14. Flank
15. Last rib (13th)
16. Ribs
17. Sheath
18. Underline
19. Fore flank
20. Shank
21. Dewclaw
22. Coffin
23. Pastern
24. Fetlock
25. Knee
26. Elbow
27. Brisket
28. Shoulder
29. Dewlap
30. Shoulder vein
31. Muzzle
32. Nostril
33. Nose
34. Face
35. Forehead
36. Body

INFORMATION SHEET

B. Swine (Transparency 2)

1. Nostril
2. Snout
3. Ear
4. Poll
5. Neck
6. Shoulder
7. Back
8. Loin
9. Rump (hip)
10. Tail
11. Ham
12. Stifle
13. Hock
14. Hindleg
15. Dewclaw
16. Hind flank
17. Side
18. Sheath
19. Belly
20. Fore flank
21. Knee
22. Foreleg
23. Coffin
24. Pastern
25. Fetlock
26. Jowl
27. Cheek

C. Sheep (Transparency 3)

1. Mouth
2. Nose
3. Face
4. Forehead
5. Poll
6. Neck
7. Top of shoulder
8. Back or rack
9. Loin
10. Ribs
11. Rump
12. Hip
13. Dock
14. Leg of lamb
15. Stifle
16. Hock
17. Cannon bone
18. Hoof
19. Rear flank
20. Last rib
21. Belly
22. Body
23. Fore flank
24. Coffin
25. Pastern
26. Fetlock
27. Knee
28. Fore shank
29. Elbow
30. Breast
31. Shoulder

D. Dairy cattle (Transparency 4)

1. Muzzle
2. Nostril
3. Nose
4. Face
5. Forehead
6. Poll
7. Horn
8. Neck
9. Withers

INFORMATION SHEET

(cont.)

10. Crops
11. Back
12. Chine
13. Loin
14. Ribs
15. Hip
16. Rump
17. Thurl
18. Tail head
19. Pin bones
20. Rear udder attachment
21. Thigh
22. Stifle
23. Hock
24. Switch
25. Dewclaw
26. Hoof
27. Teats
28. Udder
29. Flank
30. Mammary veins
31. Barrel
32. Coffin
33. Pastern
34. Fetlock
35. Knee
36. Elbow
37. Brisket
38. Heart girth
39. Shoulder
40. Dewlap

D. Horse (Transparency 5)

1. Forehead
2. Face
3. Bridge of nose
4. Nostril
5. Muzzle
6. Upper lip
7. Lower lip
8. Under lip
9. Throat latch
10. Poll
11. Crest
12. Neck
13. Point of shoulder
14. Chest
15. Arm
16. Elbow
17. Forearm
18. Knee
19. Cannon
20. Ankle
21. Pastern
22. Coronet
23. Fetlock
24. Girth
25. Shoulder
26. Barrel
27. Abdomen
28. Hoof
29. Hock
30. Gaskin
31. Stifle
32. Flank
33. Buttock
34. Point of hip
35. Croup
36. Loin
37. Back
38. Withers
39. Thigh

INFORMATION SHEET

IV. Desirable and undesirable animals

- A. Beef (Transparencies 6 and 7)
- B. Swine (Transparency 8)
- C. Sheep (Transparency 9)
- D. Dairy (Transparencies 10 and 11)

V. Wholesale cuts of beef, pork, and lamb

- A. Beef (Transparency 12)
    1. Chuck
    2. Rib
    3. Loin
    4. Rump
    5. Round
    6. Shank
    7. Flank
    8. Plate
    9. Fore shank
    10. Brisket
        - a. The average dressing percentage of a beef animal is 55% of the live weight.
        - b. The 4 primal cuts of the beef carcass are:
            - a) Round
            - b) Loin
            - c) Rib
            - d) Chuck

            These cuts make up 70-75% of the carcass weight.
        - c. The wholesale cuts of the forequarter are:
            - a) Rib
            - b) Plate
            - c) Chuck
            - d) Brisket
            - e) Shank

            52% of the carcass
        - d. The wholesale cuts of the hindquarter are:
            - a) Round
            - b) Loin

c) Flank
48% of the carcass
d) Kidney Knob

B. Pork (Transparency 13)

1. Jowl
2. Boston Butt
3. Back
4. Loin
    a. The average dressing percentage of swine is 72-75%
    b. The hog carcass is not divided into quarters as was the beef carcass
5. Rump
6. Picnic
7. Side
8. Ham

C. Lamb (Transparency 14)

1. Leg
2. Sirloin

   Loin

4. Rack
    a. The average dressing percentage of lamb is 52%
    b. The lamb carcass is divided into the fore- and hind saddle
    c. Both the fore- and hind saddle make up 50% of the carcass
5. Shoulder
6. Fore shank
7. Breast

VI. Approximate yield percentage of a beef, lamb, and pork carcass

A. Beef (Transparency 15)

1. Brisket--5%

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2. Chuck--26%
3. Shank--4%
4. Rib--9%
5. Plate--8%
6. Short loin--8%
7. Flank--5%
8. Sirloin--9%
9. Round--23%

B. Pork (Transparency 16)

1. Jowl--3%
2. Boston butt--6.5%
3. Picnic--8.5%
4. Loin--15%
5. Spareribs--3%
6. Side--17.5%
7. Ham--18.5%

C. Lamb (Transparency 17)

1. Shoulders--24%
2. Shank--4%
3. Ribs--12%
4. Flank and breast--13%
5. Loin--11%
6. Leg with sirloin on--33%

VII. Comparative advantages terms and criticism terms for livestock selection

A. Terms for use in giving reasons on market steers

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Comparative Advantages	Criticisms
1. General terms	
a. Meatier, heavier muscled, more muscular, more expression of muscling	Light muscled
b. More correctly finished	Overfinished, underfinished
c. Trimmer	Fat, wasty
d. More modern type	Old-fashioned
e. Larger framed, more scale	Small framed, lacked scale
f. More length of leg	Dumpy, short legged
g. Longer bodied, stretchier	Short bodied, too compact
h. Nicer balanced, more symmetrical	Poorly balanced
i. Smoother, higher quality	Rough, low quality, coarse
j. Straighter lined, tighter framed	Slack framed
2. Conformation	
a. Meatier topped	Narrow
b. Meatier over the back and/or loin	Narrow over the back and loin
c. More spring of rib	Flat-ribbed, narrow through fore-rib
d. Fuller through the crops	Narrow over crops
e. Stronger top	Weaker topped, down in top
f. Straighter top	High over loin, low behind shoulders
g. Longer rump	Short rump

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	Comparative Advantages	Criticisms
h.	Leveler rump	Droopy in the rump
i.	Thicker, meatier rump	Tapered or narrow rump
j.	Heavier, plumper, more bulging, meatier, more muscular, deeper, thicker quarter	Light, flat, shallow, narrow quarter
k.	Heavier muscled, more bulging, meatier in the stifle region	Lacks bulge or muscling through stifle
l.	Trimmer middled	Heavy or wasty middled
m.	Trimmer fronted (trimmer in brisket and dewlap)	Heavy fronted (or in brisket and/or dewlap)
n.	Wider fronted (wider through chest floor)	Narrow fronted
o.	Stands wider behind (or in front)	Stands close behind (or in front)

3. Finish

a.	Trimmer finished	Fat, wasty, overfinished
b.	Trimmer flank, brisket, over ribs	Wasty flank
c.	More correctly finished steer	Was overfinished, or underfinished
d.	More uniformly finished (covered)	Patchy finish
e.	Smoother finished	Patchy finish
f.	Firmer finished	Soft finish

4. Quality

a.	Smoother fleshed, higher quality, freer of patchiness	Rough, low quality

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Comparative Advantages	Criticisms
b. Straighter lined (top and bottom)	Slack framed, weak topped
c. Smoother about hooks	Hooky or rough about hooks
d. Smoother laid in at shoulders (nicer blending of neck and shoulders)	Rough, coarse, or wing-shouldered
e. Smoother (neater) about tail head	Rough, patchy, or prominent about tail head
f. Smoother finish	Rough, patchy finish
g. Trimmer middled	Heavy, wasty middled

5. Carcass
   - a. Would yield a meatier carcass
   - b. Would hang up a beefier, thicker, heavier muscled carcass
   - c. Would yield a carcass with a high cutability
   - d. Would yield a trimmer more desirable finished carcass with less fat trim
   - e. Would yield a carcass with a higher percent of trimmed retail cuts

B. Terms for use in giving reasons on breeding cattle

1. General terms--Same as for steers (emphasize correctness, balance, quality, and straightness of lines)

Comparative Advantages	Criticisms
a. More correct structurally (on feet and legs and skeletally)	Lacked correctness
b. Larger, growthier	Small

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Comparative Advantages	Criticisms
c. Larger framed, more scale	Small framed, lacked scale
d. Longer bodied, stretchier	Short bodied, old-fashioned
e. More rugged (use with bulls)	Lacked ruggedness
f. More constitution	Lacked constitution

2. Conformation--Same terms as given for steers

3. Finish--Do not use the word "finish" on breeding cattle

(NOTE: Trimness if certainly desirable in breeding cattle.)

4. Quality--Same as for steers

5. Correctness or soundness of feet and legs

a. Sounder, more correct	Unsound, lacked correctness
b. Stood more correctly or straighter on rear legs as viewed from rear	Bowlegged (out at the hocks), cow-hocked (stood close at the hocks)
c. Stood more correctly on rear legs as viewed from side, more desirable set to the hocks	Sickle-hocked (too much set to hocks), post-legged (too straight in the hock)
d. Stood straighter on front legs as viewed from side	Over at the knees (buck-kneed), back at the knees (calf-kneed)
e. Stood wider in front	Stood close at the knees (knock-kneed) or narrow fronted
f. Stood straighter in front	Toed in or toed out
g. More substance of bone, was heavier boned, had more rugged bone	Fine boned or light boned
h. Higher quality, cleaner, flatter bone	Coarse, low quality boned
i. Stood on stronger pasterns (front and/or rear)	Weak in the pasterns

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j. Nicer (freer, easier, more correct) walking (or moving)	Poor walking, stiff, short strided, spraddles, walks under, knuckles over

6. Breed and sex character

Comparative Advantages	Criticisms
a. More (Angus, Hereford, Shorthorn) breed character about head	Plain headed
b. More feminine about head, cleaner, more refined about head and neck (heifers)	Coarse, lacked Femininity
c. More masculine, burlier about head and neck (bulls)	Lacked masculinity

C. Terms for use in giving reasons on market barrows

1. General terms

a. Meatier, heavier muscled, more muscular, more expression of muscling	Light muscled
b. Longer, longer sided, stretchier	Short, short sided
c. Trimmer (cleaner)	Wasty, overfinished
d. Firmer	Soft, flabby
e. More correctly (desirable) finished	Overfinished
f. Nicer balanced, more symmetrical	Poorly balanced
g. Smoother, higher quality	Low quality
h. Tighter framed	Slack framed
i. More scale	Short legged, dumpy
j. More substance	Fine boned

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	Comparative Advantages	Criticisms
2.	Conformation	
a.	Trimmer, cleaner and/or firmer in jowl	Heavy, wasty jowled
b.	Cleaner or trimmer about neck	Thick, coarse, wasty through neck
c.	Smoother laid in at shoulders neater in shoulders	Rough, coarse, open about shoulders
d.	Bolder, fuller, more spring of rib	Flat-ribbed, lacked spring of rib
e.	Longer, smoother sided	Short, wrinkled in side
f.	Meatier and/or more muscular over shoulders, back, loin, and rump, more natural thickness and musculing over back, loin, and rump	Narrow, light muscled over shoulders
g.	More expression of muscling over the top	Light muscled
h.	More uniformly turned in the arch	Uneven in arch (low behind shoulders, steep rump)
i.	Stronger top	Weak top or arch
j.	Cleaner over the loin edge	Too much right angle spread
k.	Longer in the rump (longer hammed or hooks up higher in the ham)	Short rumped (or short hammed)
l.	Meatier in the rump or more flare of rump	Tapered or narrow through rump
m.	Higher tail setting	Low tail setting, steep in the rump
n.	Heavier, plumper, more bulging, fuller, meatier, more muscular, deeper, thicker ham	Light, flat, light-muscled, narrow ham
o.	Trimmer, firmer, freer of wrinkles about base of ham (or through crotch of ham)	Wasty, soft, wrinkled about base of ham
p.	Deeper ham	Shallow, cut up in ham

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Comparative Advantages	Criticisms
q. More bulge through stifle (or lower ham or base of ham)	Narrow through stifle or base of ham
r. More flare through the rump or ham	Narrow through rump or ham
s. Plumper, fuller through cushion of ham	Narrow through cushion of ham
t. Stood wider behind (or in front)	Stood narrow behind (or in front)
u. More length of leg	Short legged
3. Finish	
a. Trimmer (cleaner), more desirably (or correctly) finished	Wasty, overfinished
b. Firmer	Soft
c. Cleaner top	Too much finish down top, right angle spread over top
d. Firmer, cleaner, or freer of waste over shoulders, shoulder pocket, through side and base of ham and jowl	Soft, wasty, wrinkled over shoulders
e. Trimmer, firmer in underline	Soft, wasty in the underline
4. Quality	
a. Smoother, freer of wrinkles over shoulders and through side and base of ham	Wrinkled over shoulders
b. Neater laid in at shoulders	Rough, coarse, open in shoulders
c. Trimmer middle, trimmer underline	Wasty, heavy middled, or wasty underline
d. Cleaner, more refined about head and ear	Coarse, large head and/or ear

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Comparative Advantages — Criticisms

5. Carcass
    - a. Would yield (or hand up) a meatier, heavier muscled carcass with a higher percent of the lean cuts or ham and loin
    - b. Would yield a meatier, trimmer carcass with a higher ration of lean to fat
    - c. Would yield a trimmer, meatier carcass with less fat trim (or backfat)
    - d. Would hang up a trimmer, less wasty carcass
    - e. Would hang up a longer, trimmer carcass

D. Terms for use in giving reasons on breeding gilts

1. General terms (same as for barrows)

a. More correct (on feet and legs)	Lacked correctness
b. Larger, growthier	Small
c. Larger framed, more scale	Small framed, lacked scale
d. More length of leg	Short legged
e. Broodier (as shown by depth of side, roominess of middle, and and underline)	Lacked broodiness
f. More rugged with more constitution (width of chest floor, depth heart, spring of rib)	Lacked ruggedness or constitution

2. Conformation--Same terms as for barrows

3. Finish--"Finish" is not mentioned in gilt or boar reasons

(NOTE: "Trimness" and "firmness" are certainly desired and are used in reasons terminology as in barrow terminology.)

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4. Quality--Same as for barrows

   (NOTE: Do not criticize gilts for a small amount of middle.)

5. Correctness or soundness of feet and legs

Comparative Advantages	Criticisms
a. Straighter front (or hind) legs as viewed from side (or behind)	Bowlegged (out at hocks), cow-hocked, sickle-hocked, over at knees (buck-kneed)
b. Stood wider in front	Stood close at knees (knock-kneed) or close in front
c. Stood straighter in front	Toed out, toed in front
d. Stood on straighter, stronger rear (or front) pasterns	Weak pasterns (front or rear)
e. Stood on more substance of bone, was heavier boned, had more rugged bone	Fine boned or light boned
f. Stood on higher quality, cleaner bone	Coarse, low quality bone
g. Nicer (freer, easier, more correct) walking (or moving) gilt	Poor, stiff walking gilt

6. Breed and sex character

a. Broodier about the under-line	Lacks broodiness and/or prominence
b. More prominent about the underline	Lacked prominence (or development) of underline, has inverted nipples
c. Large number of nipples	Lacked number of nipples
d. More evenly spaced nipples or underline	Poor spacing of underline
e. Sounder underline	Unsound in the underline

E. Terms for use in giving reasons on market lambs

   1. General terms

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Comparative Advantages	Criticisms
a. Meatier, heavier muscled, more muscular, more expression of muscling	Light muscled
b. Thicker, meatier topped	Narrow
c. More desirably finished	Overfinished, underfinished
d. Trimmer	Wasty, fat
e. More modern type	Old-fashioned
f. More length of leg	Short legged, dumpy
g. Longer bodied	Short bodied, too compact
h. Nicer balanced, more symmetrical	Poorly balanced
i. Firmer, harder handling	Soft
j. Straighter lined, tighter framed	Slack framed
k. Smoother, higher quality	Rough, low quality, coarse
2. Conformation	
a. Wider (thicker and/or meatier topped	Narrow
b. More natural thickness and muscling over the top, wider (thicker and/or meatier) over rack, back, and loin	Narrow over rack
c. More spring of rib	Flat-ribbed, narrow through fore-rib
d. Straighter, stronger, firmer top	Weak topped, down in top
e. Longer rump	Short rumped
f. Leveler rump	Drooping in the rump
h. Fuller at the dock	Tapered in the dock
i. Heavier, plumper, more bulging, meatier, more muscular, firmer, deeper, thicker leg	Light, flat, shallow, narrow, soft leg

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Comparative Advantages	Criticisms
j. Trimmer middled	Heavy or wasty middled
k. Wider fronted, wider through chest floor or breast	Narrow fronted, narrow chest
l. Stands wider behind (or in front)	Stands close behind (or in front)
m. More length of leg	Dumpy, old-fashioned
3. Finish	
a. Trimmer	Fat, wasty, overfinished
b. Trimmer flank, chest, crotch, over the ribs	Wasty in the crotch
c. More desirably finished lamb	Was overfinished, or thin, underfinished
d. More uniformly finished (covered)	Lacked uniformity of finish
e. Harder or firmer handling (more desirable handling lamb)	Soft handling lamb
4. Quality	
a. Smoother, higher quality	Coarse, low quality
b. Straighter lined (top and bottom)	Slack framed, weak top
c. Smoother, neater in shoulders	Rough, coarse, or wing-shouldered
d. Trimmer middled	Heavy, wasty middled
e. Cleaner, more refined head and/or bone	Coarse about head and/or bone
5. Carcass	
a. Would yield a meatier, more muscular carcass	
b. Would hang up a thicker, heavier muscled carcass	
c. Would yield a trimmer, more desirably finished carcass with less fat trim	

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Comparative Advantages	Criticisms
d. Would yield a higher percent of leg and loin or trimmer retail cuts	

F. Terms for use in giving reasons on breeding ewes

1. General terms--Same as for market lambs (emphasize balance, quality, and straightness of lines)

Comparative Advantages	Criticisms
a. More correctly structurally (on feet and legs and skeletally)	Lacked correctness
b. Larger, growthier	Small
c. Larger framed, more scale	Small framed, lacking scale
d. Deeper bodied, broodier, roomier middled	Shallow bodied
e. More rugged	Lacked ruggedness and substance
f. Showed more constitution	Lacked constitution

2. Conformation--Same as terms given for market lambs

3. Finish--Same as for market lambs (less emphasis)

4. Quality--Same as for market lambs

5. Correctness or soundness of feet and legs

Comparative Advantages	Criticisms
a. Stood more correctly on feet and/or legs	Lacked correctness
b. Stood more correctly on rear legs as viewed from the rear	Bowlegged (out at the hocks), cow-hocked (stood close at the hocks)
c. Stood more correctly on rear legs as viewed from the side, more desirable set to the hocks	Sickle-hocked (too much set to the hocks), post-legged (too straight in the hocks)
d. Stood straighter on front legs as viewed from the side	Over at the knees (buck-kneed), back at the knees (calf-kneed)
e. Stood straighter in front as viewed from the front	Toed out or toed in
f. Stood wider in front	Stood close at the knees (knock-kneed)

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	Comparative Advantages	Criticisms
g.	More substance of bone, was heavier boned, had more rugged bone	Fine boned or light boned
h.	Higher quality, cleaner, flatter bone	Coarse, low quality bone
i.	Stood on shorter, straighter, or stronger pasterns (front and/or rear)	Long and/or weak in pasterns
6.	Breed and sex character	
a.	Showed more (Hampshire, Suffolk, Shropshire) breed character about the head	Plain headed
b.	Showed more feminity about the head	Coarse, lacked feminity
c.	Was blacker about points (or face and/or ears)	Brown or light about points
d.	Was more open about the face	Too much cover over face
e.	Was freer from wool about the ears	Wooly about the ears
f.	Had longer more desirably set ears	Was short, droopy in the ears
	Suffolk:	
g.	Was blacker and cleaner about the face and ears	Was brown or wooly about the head
h.	Was longer, cleaner, and more feminine about the head	Was short and plain headed
i.	Had longer and more desirable set to the ears	Had short, coarse, droopy, or erect ears
7.	Wool and skin	
a.	Pinker skin	Dark skinned
b.	Freer of black fiber	Carried excessive black fiber

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Comparative Advantages	Criticisms
c. Denser fleece	Open fleeced
d. Finer fleece	Coarse, hairy fleece
e. Brighter, more lustrous fleece	Dull, dirty fleece
f. More character of fleece	Lacked character of fleece

G. Terms for use in giving reasons on dairy cows

1. Mammary system
    a. Stronger fore-udder attachment
    b. More fore-udder attachment
    c. Squarer teat placement
    d. Nicer balanced udder
    e. More rear-udder development
    f. Stronger rear-udder attachment
    g. More veining on the udder indicating an udder of higher quality
    h. Stronger central suspensory membrane
2. General appearance
    a. More breed character in her head and neck
    b. Taller cow with more length and stretch
    c. Stronger in her chine
    d. Stronger in her loin
    e. More level in the rump
    f. Neater in her tail setting
    g. Straighter on her rear legs
3. Body capacity
    a. Deeper in her chest
    b. Deeper in her rear ribs

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c. Longer barrel cow

d. More spring of rib

4. Dairy character

a. Sharper in the withers

b. More lean in the ribs

c. Longer and more lean in the neck

d. More lean in the thighs

e. Sharper in her hips and pins

VIII. Suggestions for oral reasons

1. Oral reasons--Give the opportunity to defend the placing of the class and to specifically tell why each placed as it did

(NOTE: Reasons should be accurate and given in a manner which is easily understood.)

2. Gains from giving reasons

a. Ability to organize system of analyzing a class of livestock

b. Ability to think more clearly on your feet

c. Ability to state thoughts more clearly

d. Improvement of speaking poise

e. Improvement of memory

3. Important points in giving reasons

a. Accuracy--See the obvious and important points in the class and discuss them accurately and completely

b. Delivery--Present in a manner that is pleasant to hear and clear and easy to follow

(NOTE: Speak slowly and clearly, in a conversational tone, yet loudly enough to be understood and to give some "conviction" to your reasons. You should stand 6-8 feet from the judge, standing erect, feet slightly spread, and with your hands behind your back. A poor delivery will probably result in a low score regardless of the accuracy of your reasons.)

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c. Bring out the important and general points first; follow with the more specific and detailed points (much like a newspaper story)

d. Completeness--Bring out all the major differences in your reasons

e. Length--Should never be over two minutes in length

f. Terms--Know the meaning of the terms you use

(NOTE: For the purpose of your reasons, a class of four animals is divided into three pairs: a top pair, a middle pair, and a bottom pair. Follow the basic outline for a set of reasons for a placing of 1-2-3-4.)

1) Opening remarks

   a) Give name of class and how you placed it

   b) Give criticisms and outstanding good points

   (NOTE: In some cases a general statement about the entire class may be more applicable.)

2) Top pair

   a) Give reasons for placing 1 over 2, using comparative terms

   b) Give grants for 2 over 1, using comparative terms to point out advantages of 2 over 1

   (NOTE: In close placings, several grants would be desirable as long as they are true.)

   c) Give criticisms of 2, using descriptive terms

   (NOTE: Always criticize an animal on its own merits rather than comparing him to the animal placed above him.)

3) Middle pair

   a) Give reasons for placing 2 over 3

   b) Give grants for 3 over 2

   c) Give criticisms of 3

4) Bottom pair

   a) Give reasons for placing 3 over 4

   b) Give grants for 4 over 3

   c) Give criticisms of 4

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(NOTE: Do not use a great many terms in close succession. Example: "1 was a typier, thicker quartered steer than 2."

4. Words and phrases that should be avoided

   a. Animal or individual--Say "barrow," "gilt," "heifer," "mare"

   b. It--Always use "he" or "she"

   c. I would like to see--Point out the fault directly

   d. Lacks or lacked--When possible, point out the fault directly

      Example: Instead of saying "4 lacked depth," say "I criticize 4 because he was shallow."

   e. Kind of or type of (steer, barrow, etc.)

      Example: Instead of "a smoother type of barrow" it should simply be "smoother barrow"

   f. Was a heifer that was

      Example: Say "one was a larger heifer."

   g. I placed the number 1 steer over the number 2 steer

      Example: Say "I placed 1 over 2."

   h. For these reasons I place this class--Unnecessary statement

      (NOTE: Conclude your reasons with the criticisms of the bottom animal.)

B. Sample reasons

1. Hampshire barrows

I placed this class of Hampshire barrows 1-2-3-4. One was the longest sided, trimmest barrow in the class, although I fault him for being weak in his top.

In the top pair I placed one, the off-belt barrow, over two because one was a longer, stretchier barrow that was more correct in his amount of finish than two. One was trimmer in his jowl, firmer and cleaner through his shoulders, and cleaner down his top than two. Also, one was trimmer and firmer through his side and trimmer about his middle than two. Because of one's advantage in trimness he should yield a carcass with a higher percent of lean cuts and less fat trim. I would concede that two was a heavier muscled barrow that had more thickness through the center of his ham than one. However, I fault two, and placed him second for being a short-sided barrow that was wasty through his jowl and shoulders.

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In the middle pair I placed two over three because two was a nicer balanced, heavier muscled barrow than three. Two had more natural spread and muscling over his back and loin, was stronger and more evenly turned in his top, and was longer in his rump. Futhermore, two had more flare to his rump and was much wider and meatier through his stifle than three. Also, two stood wider behind and showed more evidence of muscling through his shoulders. Two should hang on the rail a meatier, heavier muscled carcass with a greater percent of high priced cuts. I grant that three was a smoother, higher quality barrow that showed more scale than two, but I fault three and placed him third because he was a light muscled barrow that narrowed through his ham.

In the bottom pair, I placed three over four, easily, because three was a much trimmer, cleaner barrow that showed more scale and stood on more length of leg than four. Three was a longer sided barrow that was cleaner down his top and more desirably turned over his loin edge. Furthermore, three was trimmer through his side and underline and through the crotch of his ham. Three will hang up a longer, trimmer carcass with a higher ratio of lean to fat. I realize that four was thicker through his lower ham, but I fault four and placed him last as he was a soft, overfinished barrow that was wasty through his middle and jowl and was short in his side and should yield the fattest, wastiest carcass of any barrow in the class.

2. Holstein cows

I place this class of Holstein cows 3-4-1-2. I chose three as my top cow and placed her over four, considering this a rather easy placing, because three excels four in dairy character and general appearance. She has a longer and leaner neck, is sharper in the withers, and is leaner in the thighs. She is also much stronger in her back and loin, more level from hips to pins, neater in her tail setting, and stands on a much straighter pair of rear legs. She is deeper in the chest and has more balance to the udder with a more even teat placement.

However, I would grant that four is deeper in the rear rib with a little higher and wider rear-udder attachment. I would like to see my top cow, three, with a little more stretch and length of barrel.

In my middle pair, four goes over one, another rather easy placing. Four excels one in body capacity and mammary system being much deeper in her rear rib and having more spread of rib. Her udder extends much higher and stronger in rear-udder attachment with more rear udder development and a neater teat placement. I grant that one stands on a straighter pair of rear legs that are stronger in the pasterns.

In my bottom pair, I placed one over two. I considered this a very close placing, but one excels two in general appearance having a little more style and balance, more breed character in her head and neck, and a

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straighter pair of rear legs. One also excels two in dairy character being sharper in the withers, a little more lean in the neck, and a little wider in the ribs.

I grant that two excels one in body capacity having a greater spring and spread of rib and being deeper in both the chest and rear ribs, but I placed her last because she lacks the overall balance of one. She is a little too short and thick in her neck, and like one, her udder is unbalanced with weak fore and rear udder attachments.

3. Lambs

I placed this class of Dorset ewes 1-4-3-2. In the top pair, I placed 1, the outstanding ewe in the class, over 4 as 1 was a larger, growthier ewe with more volume than 4. In addition, 1 was a heavier muscled ewe with more constitution and capacity than 4. One also stood on more bone and had a more desirable set to her hocks than 4. I grant that 4 exhibited more breed character and feminity about her head than 1, but I fault 4 and placed her second for being a small, light muscled ewe that was somewhat sickle-hocked.

In the middle pair, 4 was placed over 2 as 4 was a nicer balanced, straighter-lined ewe that was sounder in her structure than 2. Four was straighter and stronger over her top, longer and more level in her rump, and although she was sickle-hocked, 4 was sounder in the angle of her hock than 2. In addition, 4 was cleaner through her brisket and showed more Dorset breed character than 2. I would concede that 2 was a larger ewe that showed more depth of heart and had particularly more inside muscling to her leg than 4. Two is faulted and placed third, however, as she was droopy in her rump and too straight through her hocks.

In the bottom pair, I placed 2 over 3 as 2 was a growthier and more muscular ewe than 3 with decidedly more ruggedness and body capacity. I realize that 3 was a straighter lined, trimmer ewe than 2, but I criticize 3 and placed her last as she was a narrow, light muscled ewe that lacked the size, constitution, and capacity of the other ewes in the class.

4. Steers

I placed this class of crossbred steers 2-4-1-3. I placed 2 over 4 because he was a thicker, more muscular steer and would yield the meatiest carcass of any steer in the class. Number 2 showed evidence of more natural muscling and thickness in his round. Number 2 was longer from his hooks to his pins, a stronger topped steer when viewed from the side, and would yield a meatier, higher grading carcass and would have a higher dressing percentage. I grant number 4 was cleaner through the brisket, but I criticize number 4 for carrying an excess of finish.

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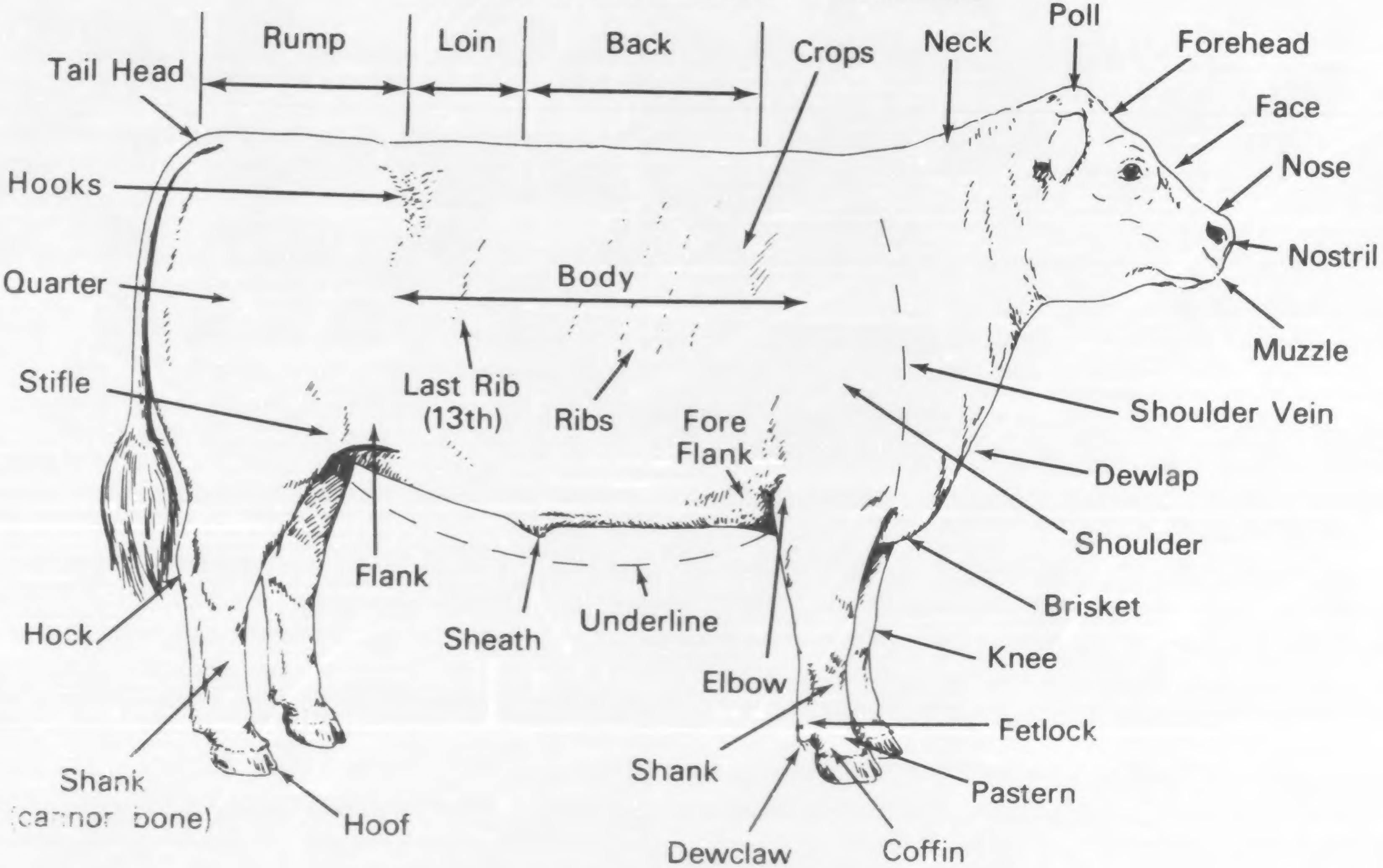
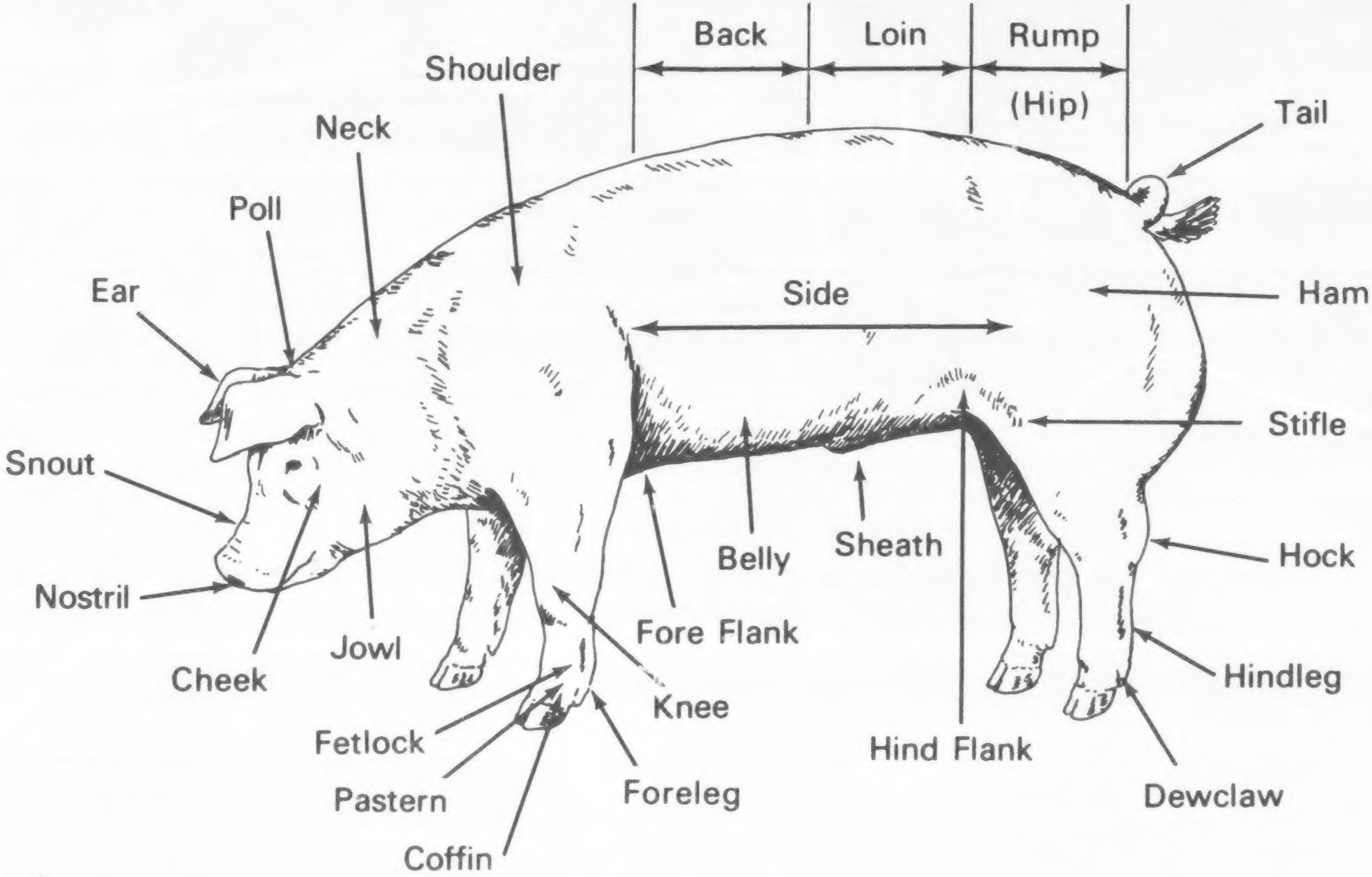
In the middle pair, I placed 4 over 1 because he was a larger, growthier, more uniformly finished steer. Number 4 showed more evidence of natural muscling and thickness in his shoulders and down his top. Number 4 was a longer rumped steer. I would concede that 1 was a cleaner steer that would yield a carcass with less fat trim, but I criticize 1 for being rough in his finish.

In the bottom pair, I placed 1 over 3 because he was a stronger topped, cleaner steer that would yield a carcass with less fat trim. Number 1 was longer in the rump with more natural thickness through his shoulders, top, rump, and round. However, I grant 3 carried more finish and would yield a higher dressing percentage, but I criticize 3 and placed him last as he was a wasty steer that lacked the combination of muscling and growthiness to place above the other steers in the class.

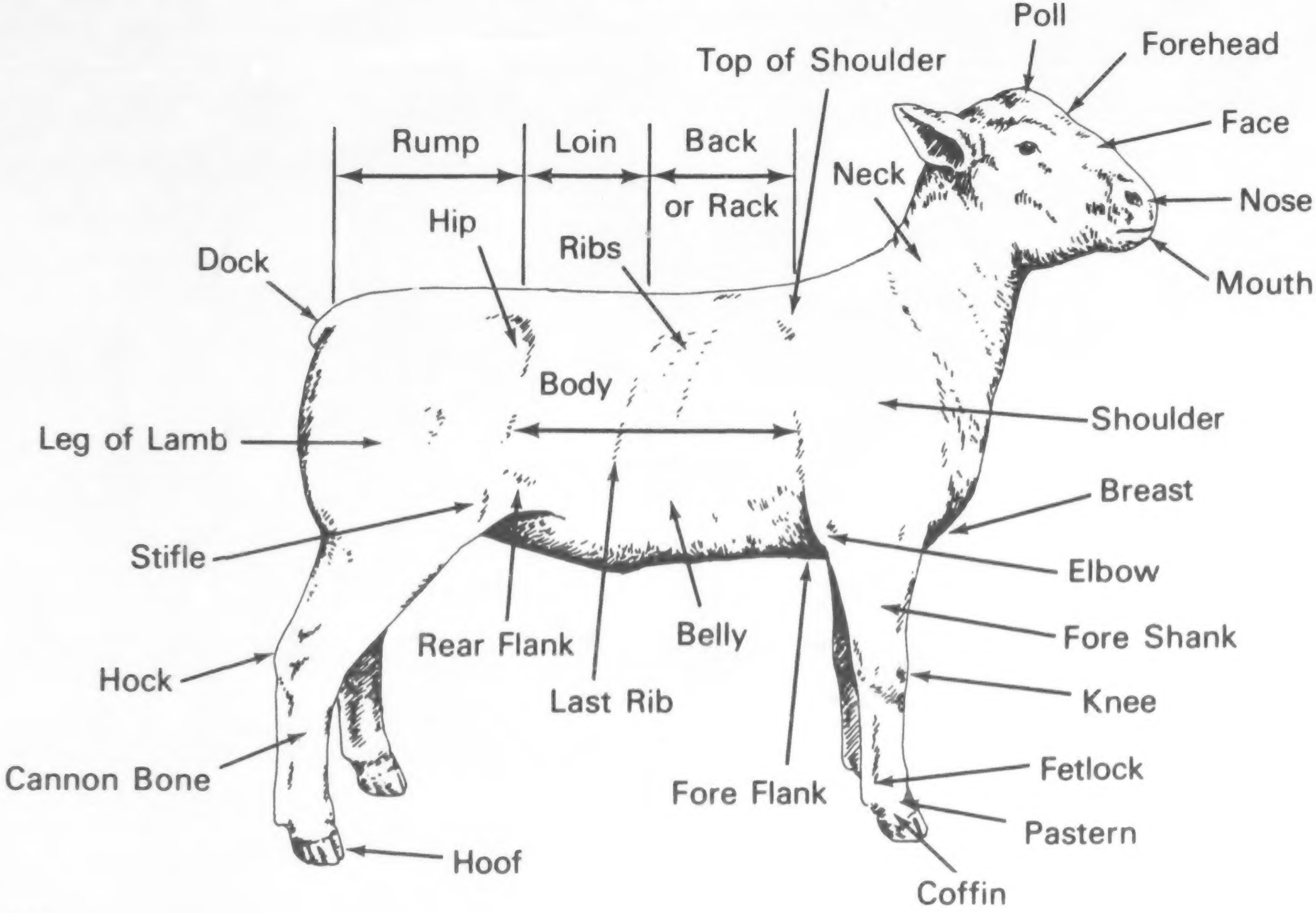
Parts of A Beef Animal


Rump
Loin
Back
Crops
Neck
Poll
Forehead
Tail Head
Face
Nose
Hooks
Nostril
Body
Quarter
Muzzle
Stifle
Last Rib (13th)
Ribs
Fore Flank
Shoulder Vein
Dewlap
Shoulder
Flank
Brisket
Underline
Sheath
Hock
Knee
Elbow
Fetlock
Shank
Shank (cannon bone)
Pastern
Hoof
Dewclaw
Coffin

Parts of A Swine


Back
Loin
Rump
(Hip)
Shoulder
Tail
Neck
Poll
Ear
Side
Ham
Stifle
Snout
Hock
Belly
Sheath
Nostril
Fore Flank
Jowl
Cheek
Hindleg
Knee
Fetlock
Hind Flank
Foreleg
Dewclaw
Pastern
Coffin

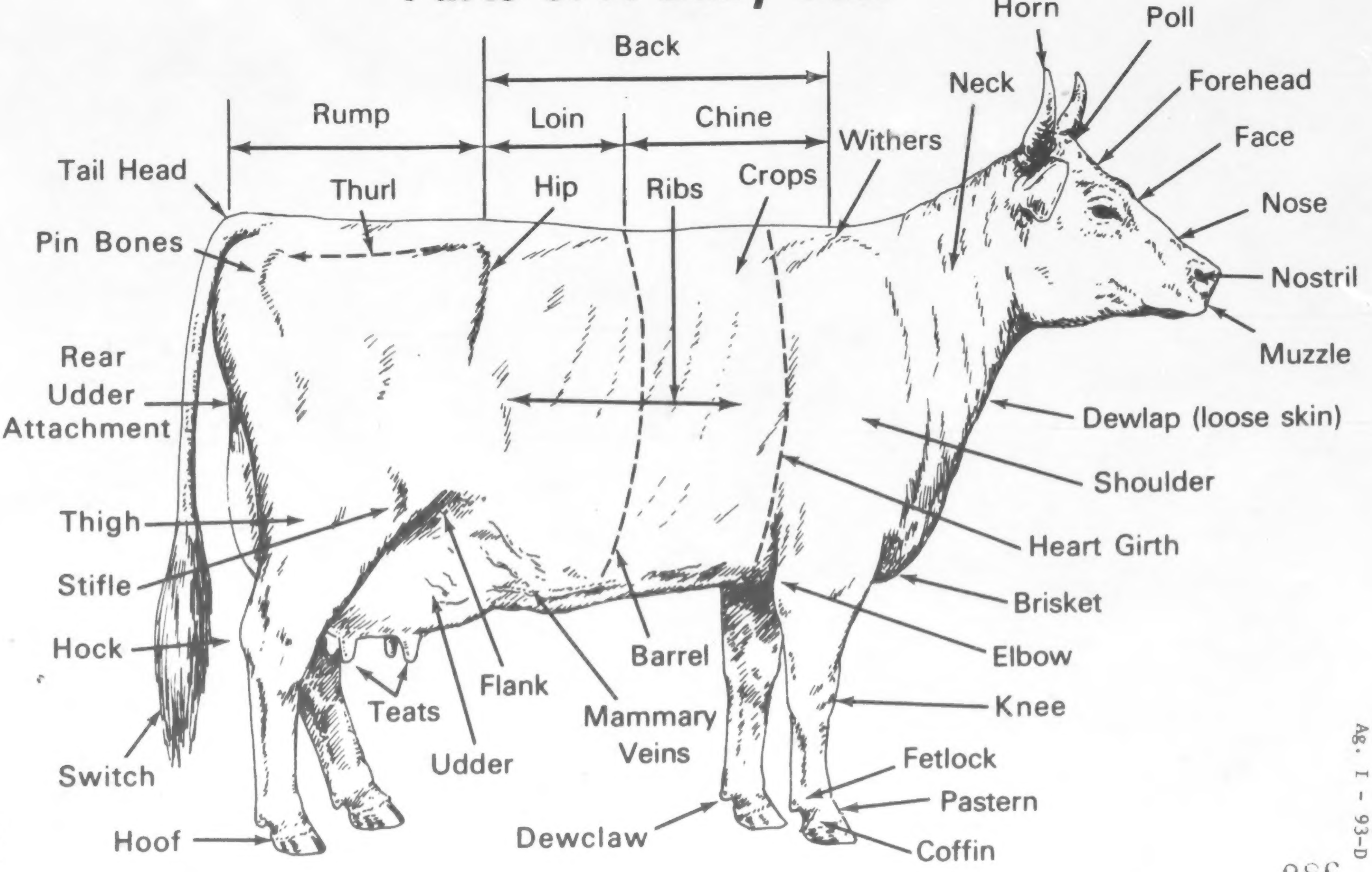
Parts of A Sheep


Poll
Forehead
Top of Shoulder
Face
Rump
Loin
Back
or Rack
Neck
Nose
Hip
Ribs
Dock
Mouth
Body
Leg of Lamb
Shoulder
Breast
Stifle
Elbow
Fore Shank
Rear Flank
Belly
Hock
Knee
Last Rib
Fetlock
Cannon Bone
Fore Flank
Pastern
Hoof
Coffin

TM 3

Ag. I - 91-D

Parts of A Dairy Cow


Back
Rump
Loin
Chine
Horn
Poll
Neck
Forehead
Withers
Face
Tail Head
Thurl
Hip
Ribs
Crops
Nose
Pin Bones
Nostril
Muzzle
Rear
Udder
Attachment
Dewlap (loose skin)
Shoulder
Thigh
Heart Girth
Stifle
Brisket
Hock
Barrel
Elbow
Flank
Teats
Knee
Mammary
Veins
Udder
Fetlock
Switch
Pastern
Hoof
Dewclaw
Coffin

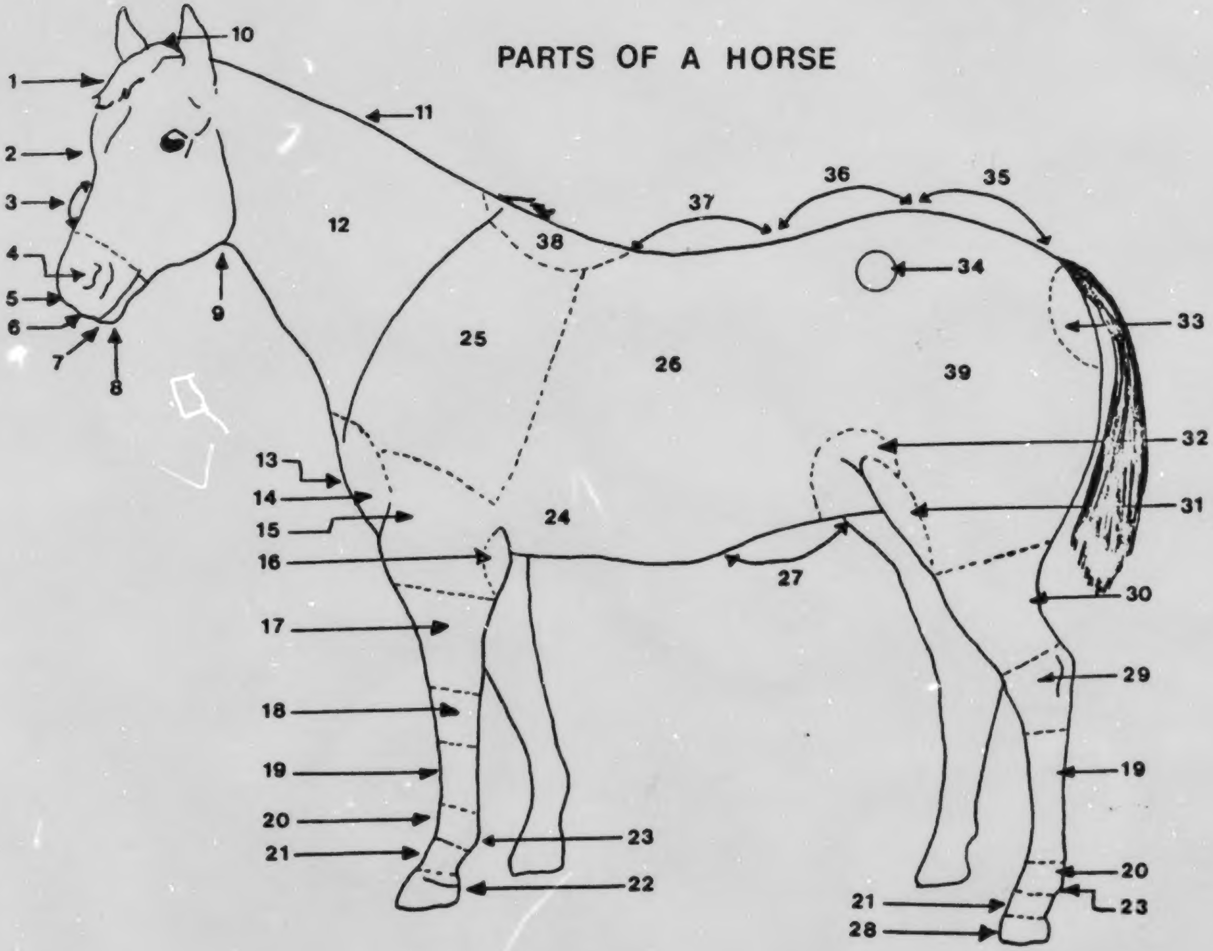
TM 4

285

Ag. I - 93-D

PARTS OF A HORSE

1. FOREHEAD
2. FACE
3. BRIDGE OF NOSE
4. NOSTRIL
5. MUZZLE
6. UPPER LIP
7. LOWER LIP
8. UNDER LIP
9. THROAT LATCH
10. POLL
11. CREST
12. NECK
13. POINT OF SHOULDER
14. CHEST
15. ARM
16. ELBOW
17. FOREARM
18. KNEE
19. CANNON
20. ANKLE
21. PASTERN
22. CORONET
23. FETLOCK
24. GIRTH
25. SHOULDER
26. BARREL
27. ABDOMEN.
28. HOOF
29. HOCK
30. GASKIN
31. STIFLE
32. FLANK
33. BUTTOCK
34. POINT OF HIP
35. CROUP
36. LOIN
37. BACK
38. WITHERS
39. THIGH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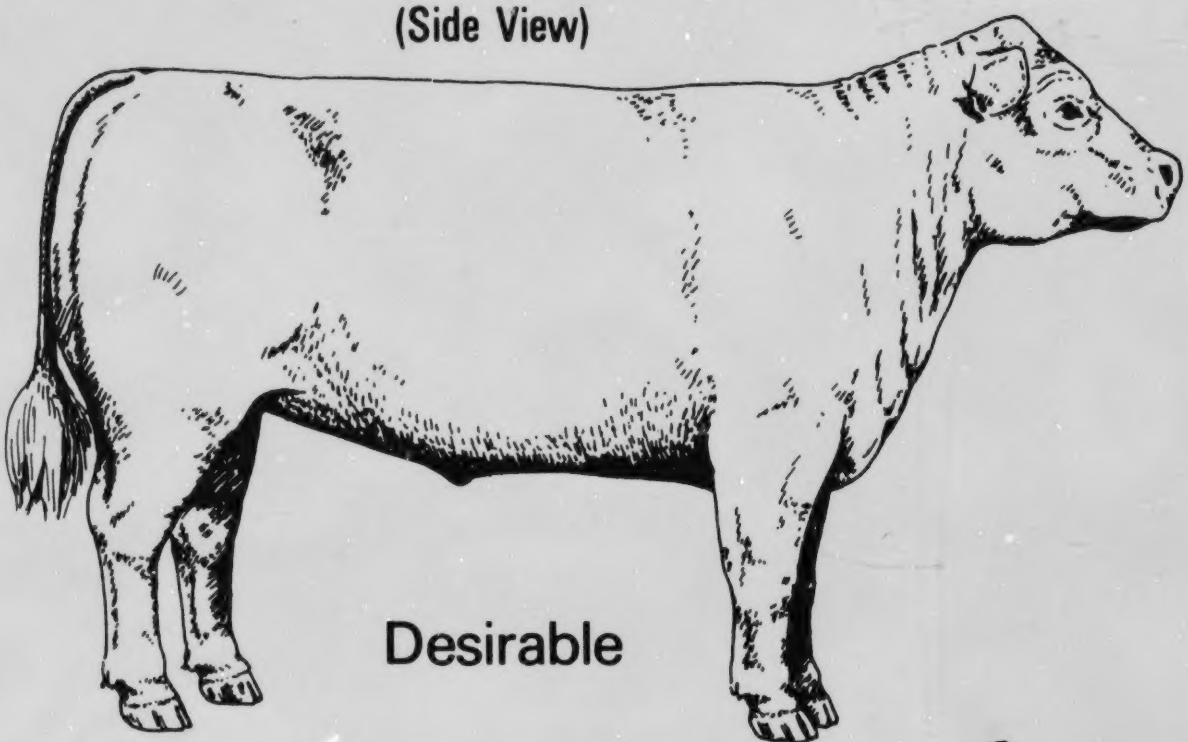
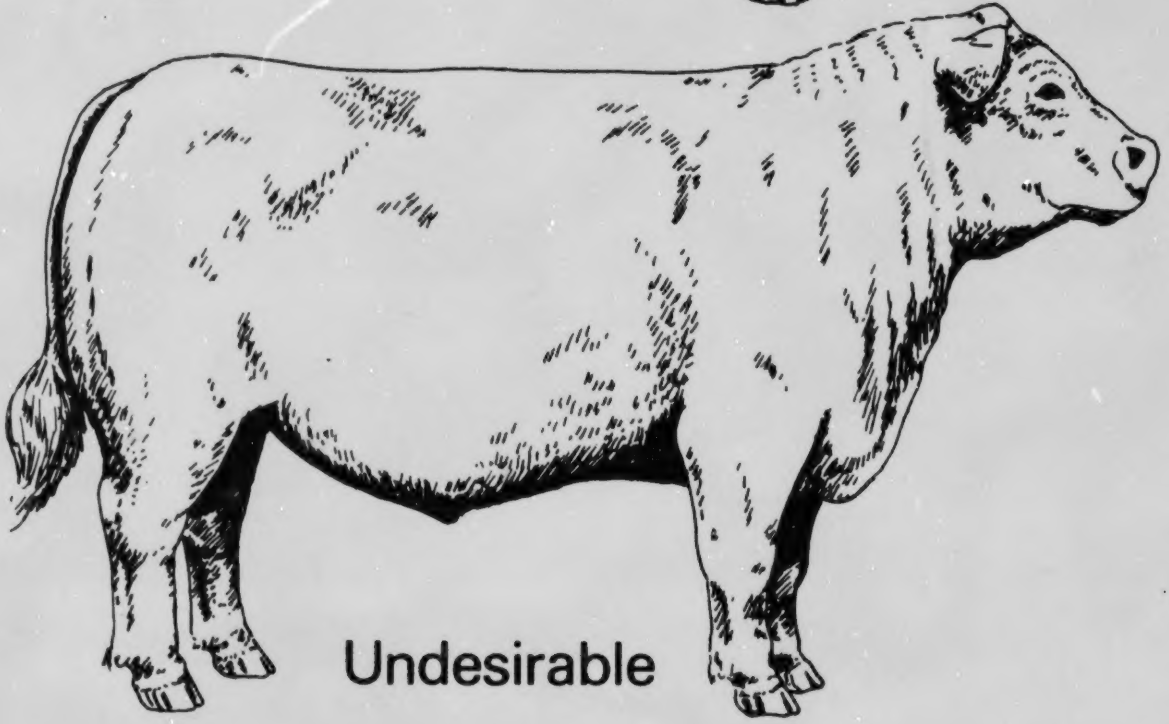
Desirable and Undesirable Beef Animals

(Side View)



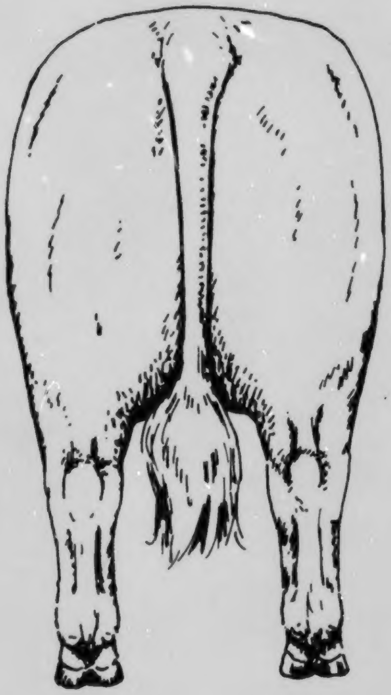
Desirable



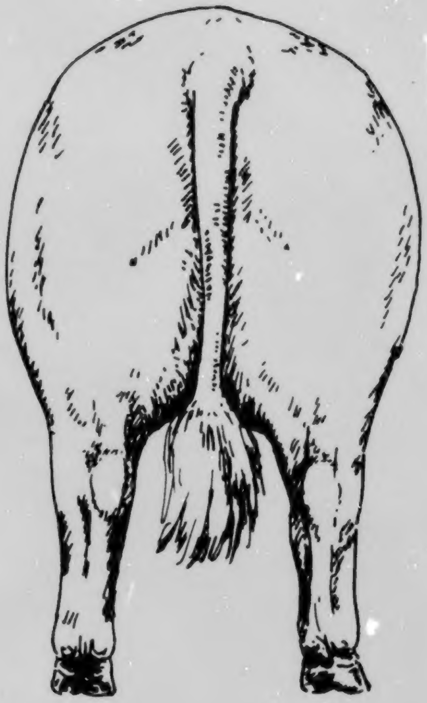
Undesirable

Desirable and Undesirable Beef Animals

(Rear View)



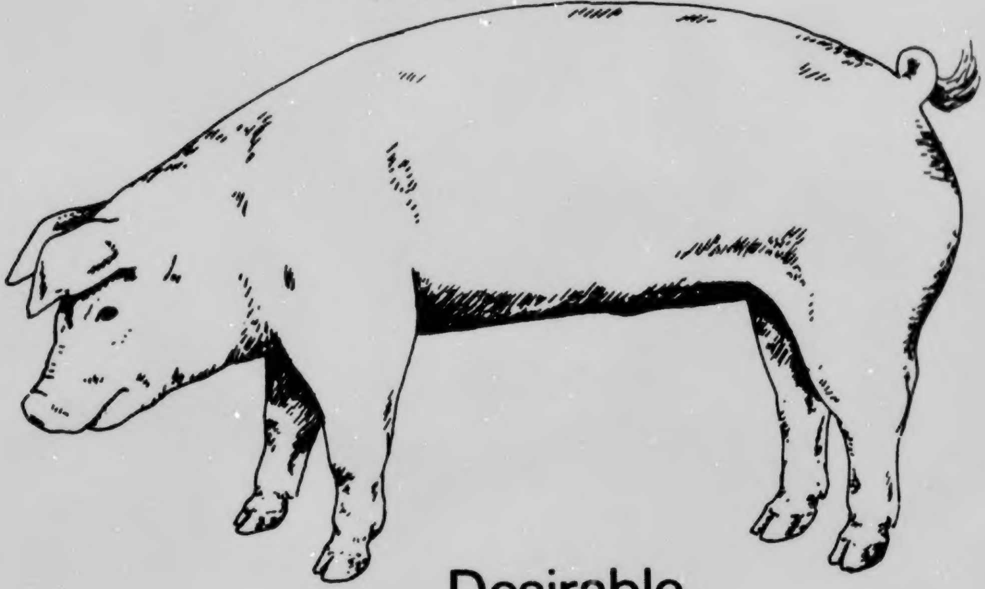
Desirable



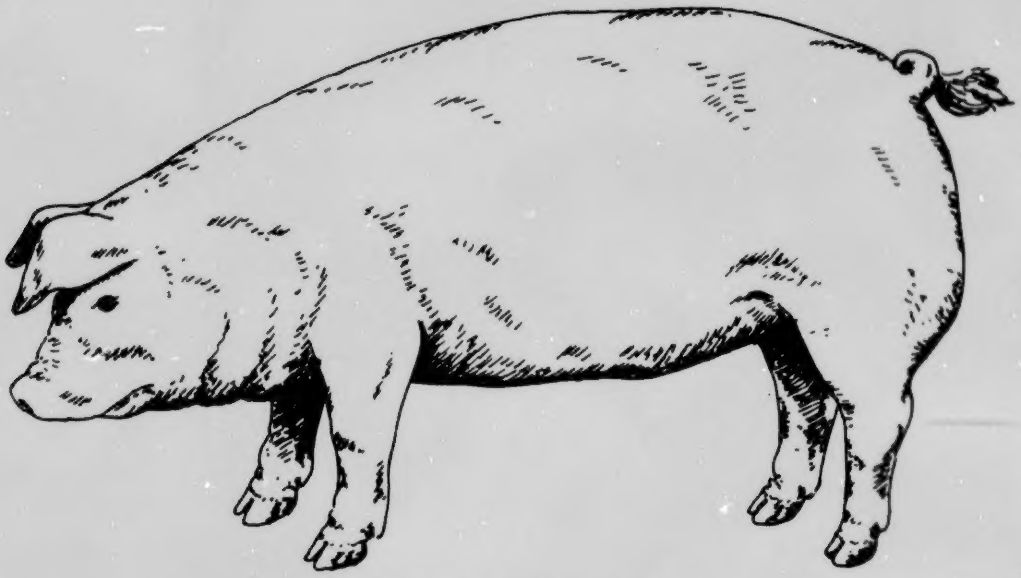
Undesirable

Desirable and Undesirable Barrows

(Side View)



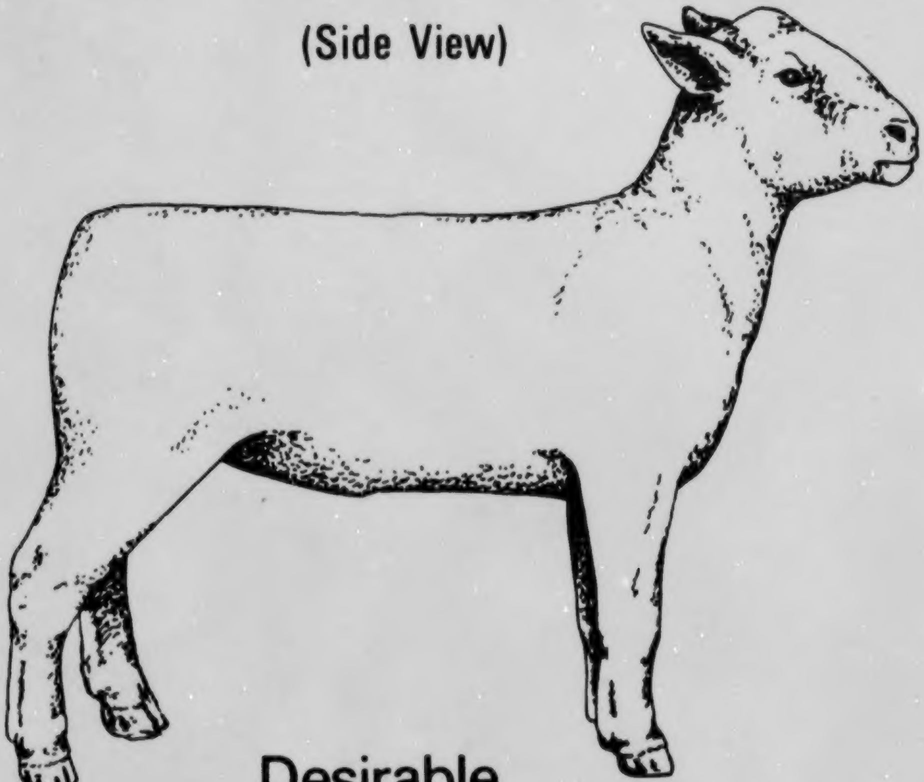
Desirable



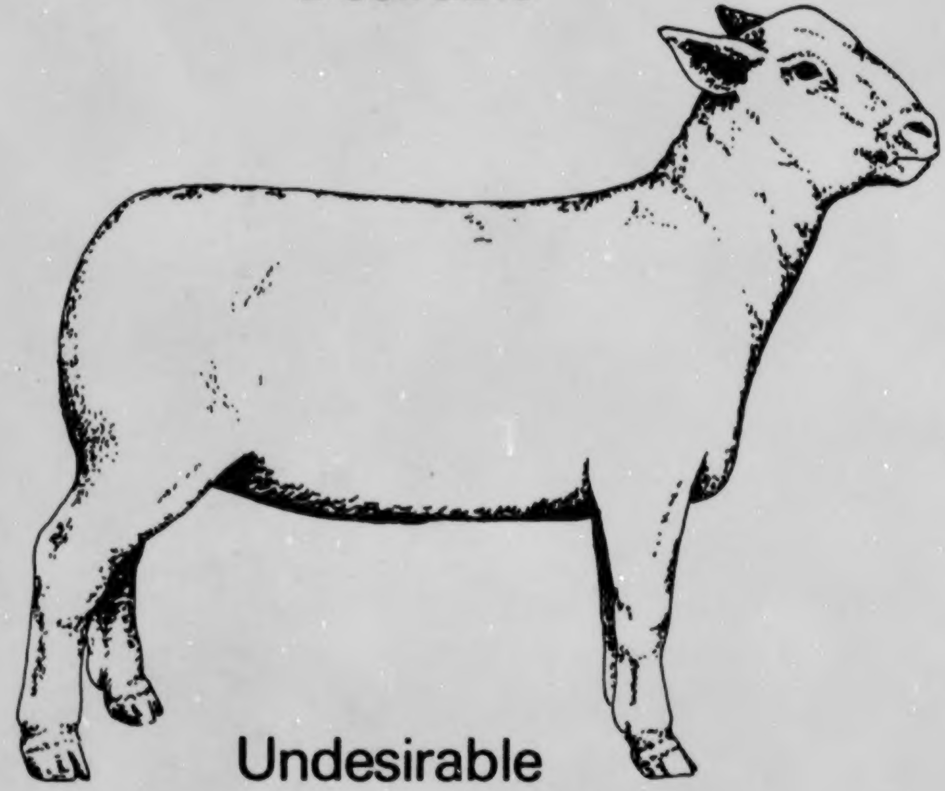
Undesirable

Desirable and Undesirable Lambs

(Side View)



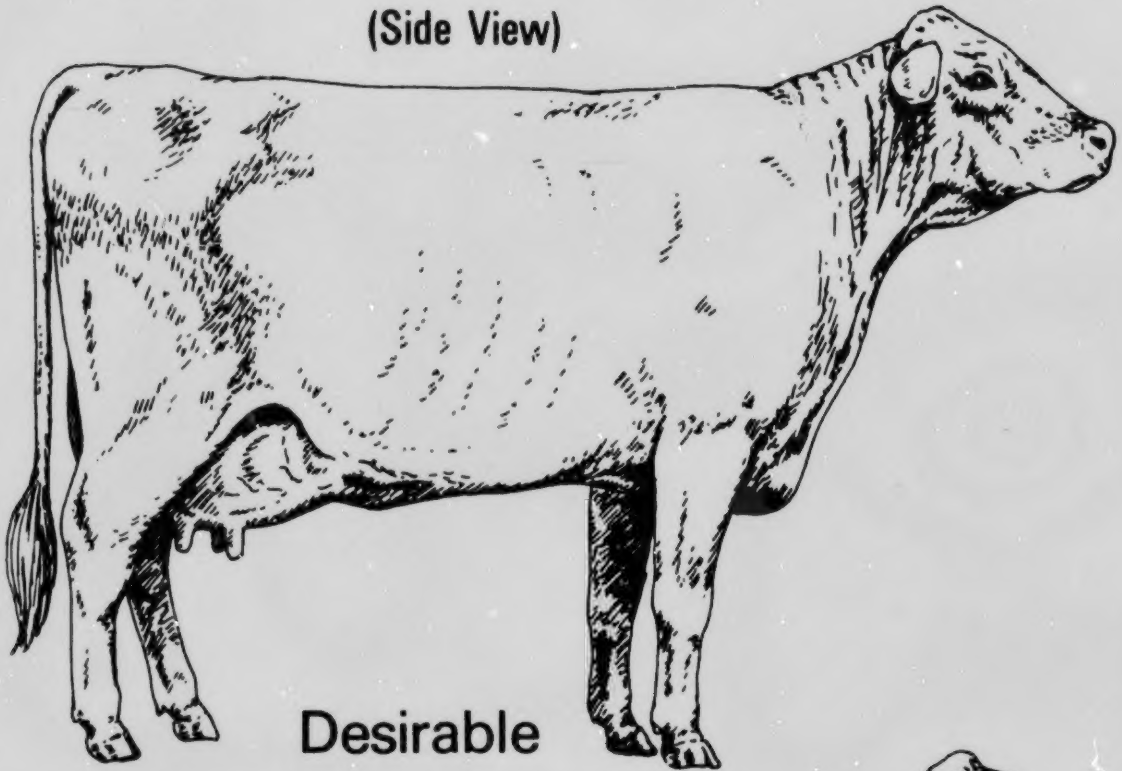
Desirable



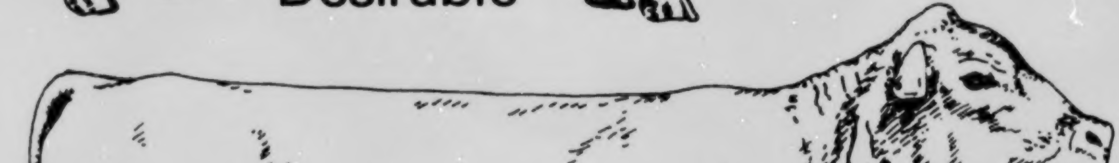
Undesirable

Desirable and Undesirable Dairy Cows

(Side View)



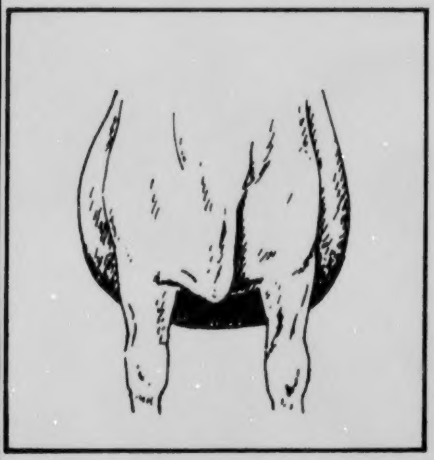
Desirable



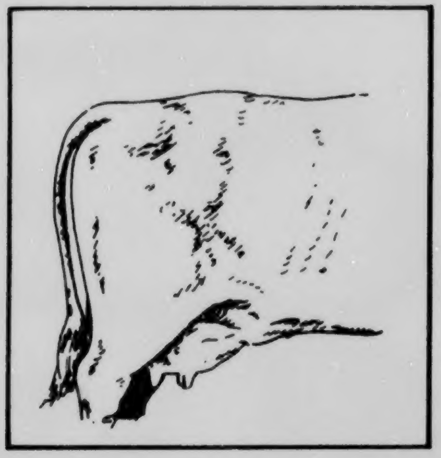
Undesirable

Desirable and Undesirable Dairy Cows

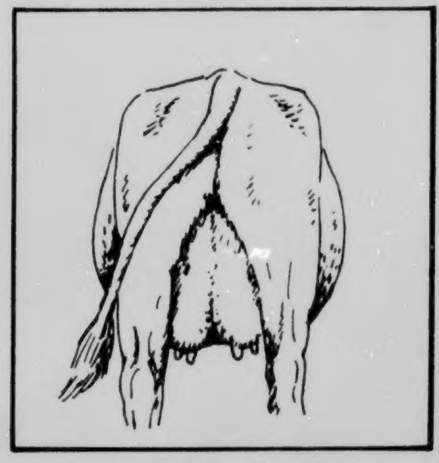
(Body Capacity and Udder and Rear Attachment)



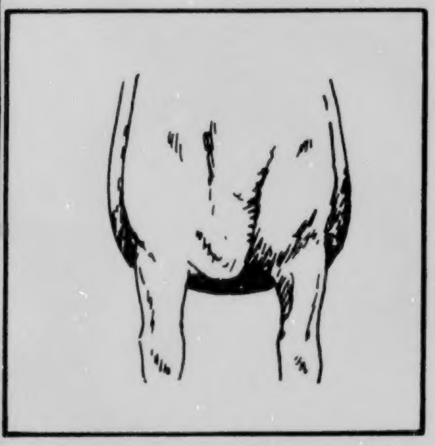
Good



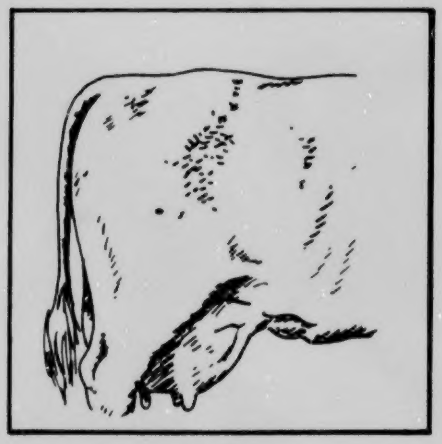
Good



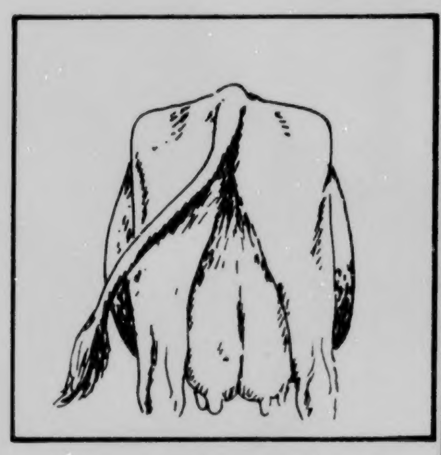
Good



Poor

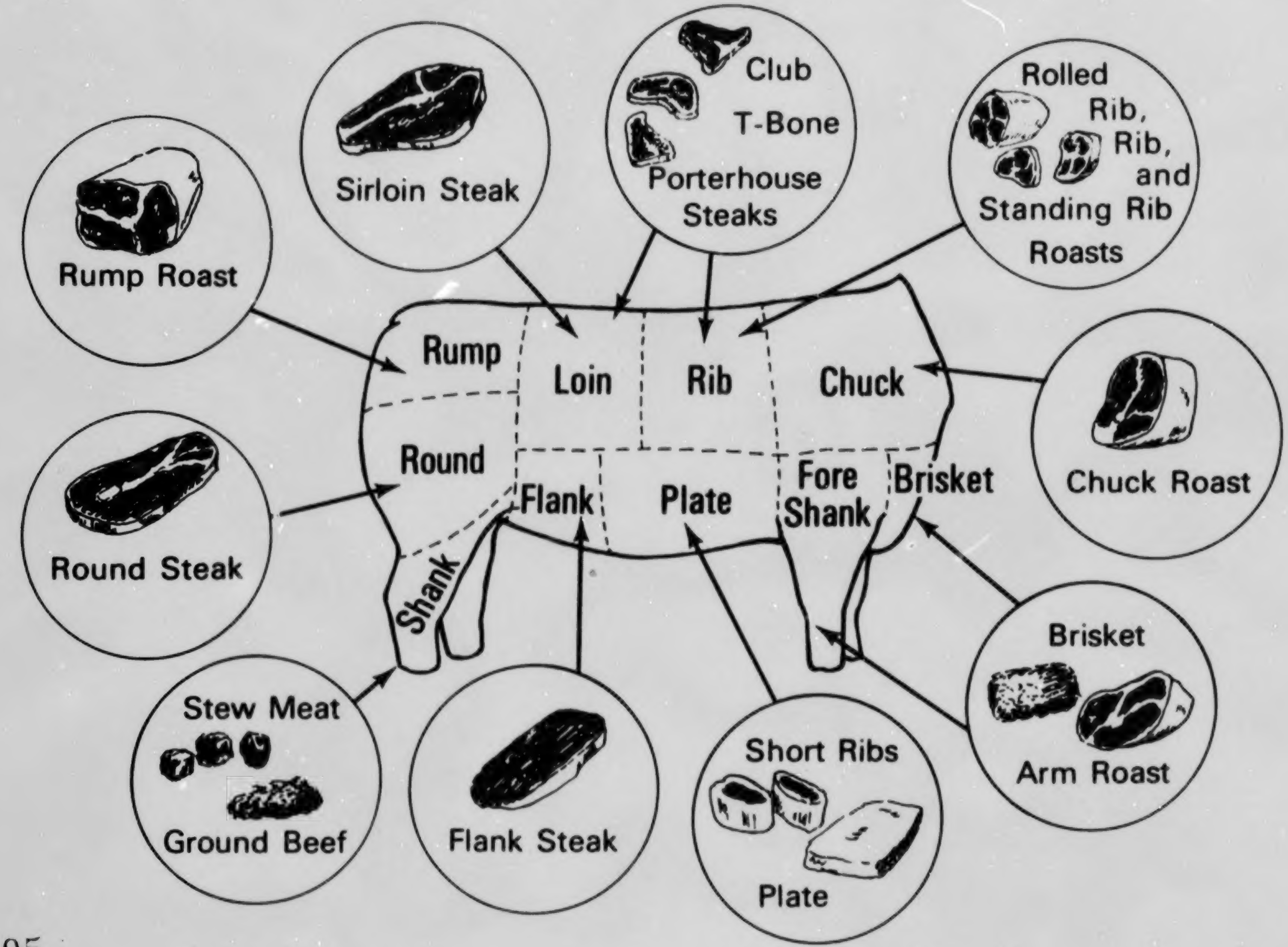


Poor

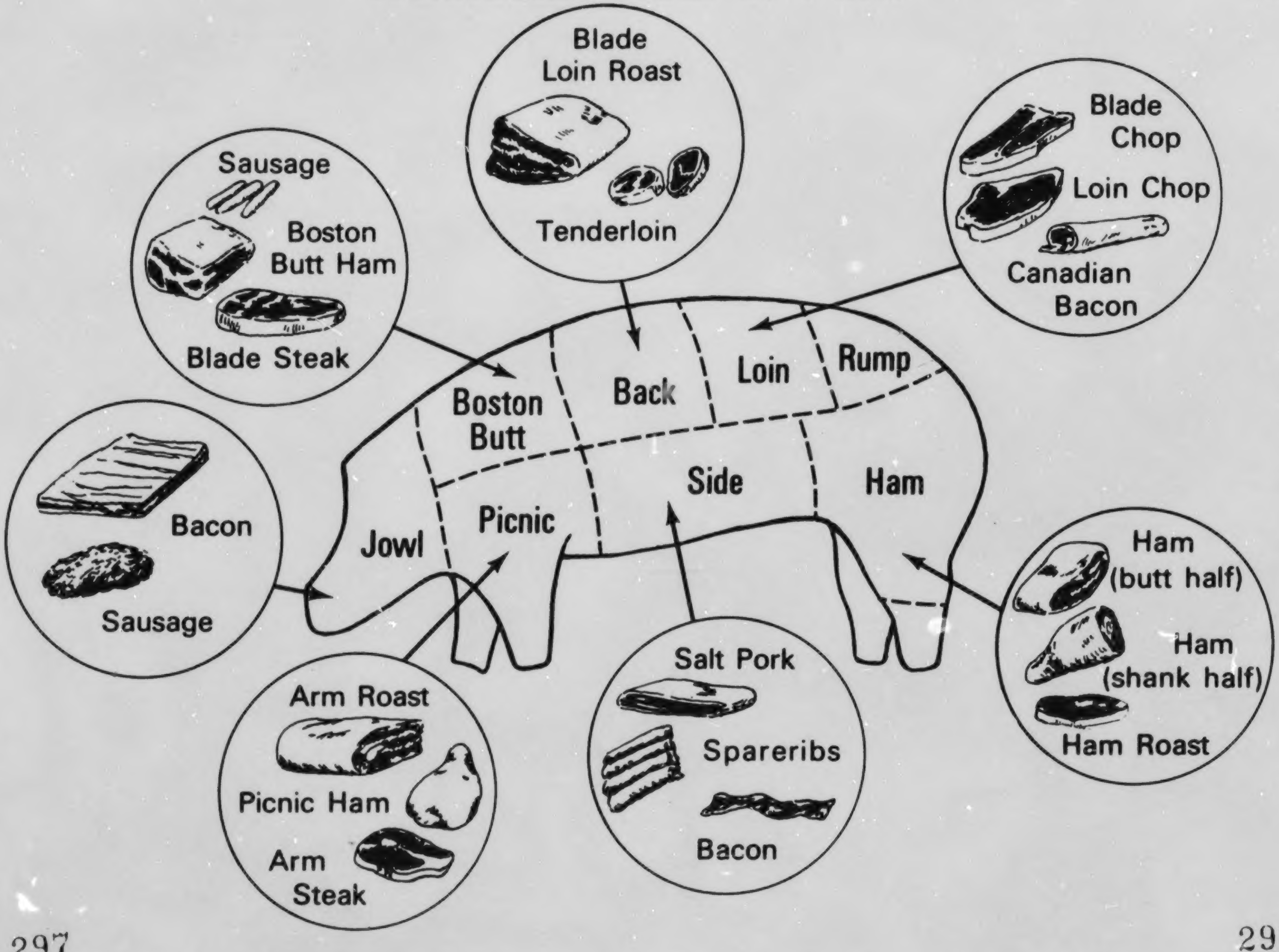


Poor

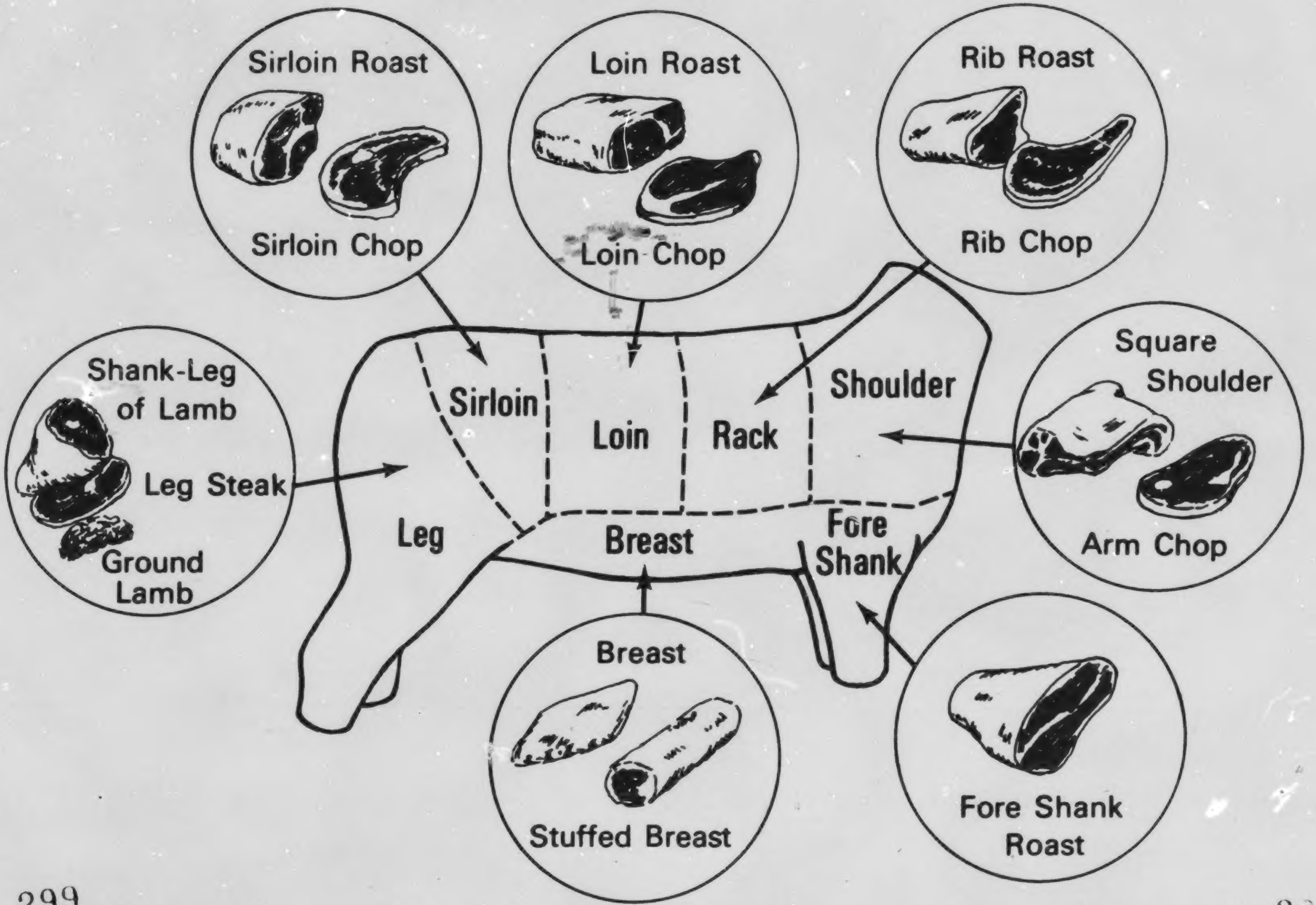
Wholesale Cuts of Beef


Sirloin Steak
Club
T-Bone
Porterhouse Steaks
Rolled Rib, Rib, and Standing Rib Roasts
Rump Roast
Rump
Loin
Rib
Chuck
Chuck Roast
Round
Round Steak
Flank
Plate
Fore Shank
Brisket
Shank
Brisket
Arm Roast
Stew Meat
Ground Beef
Flank Steak
Short Ribs
Plate

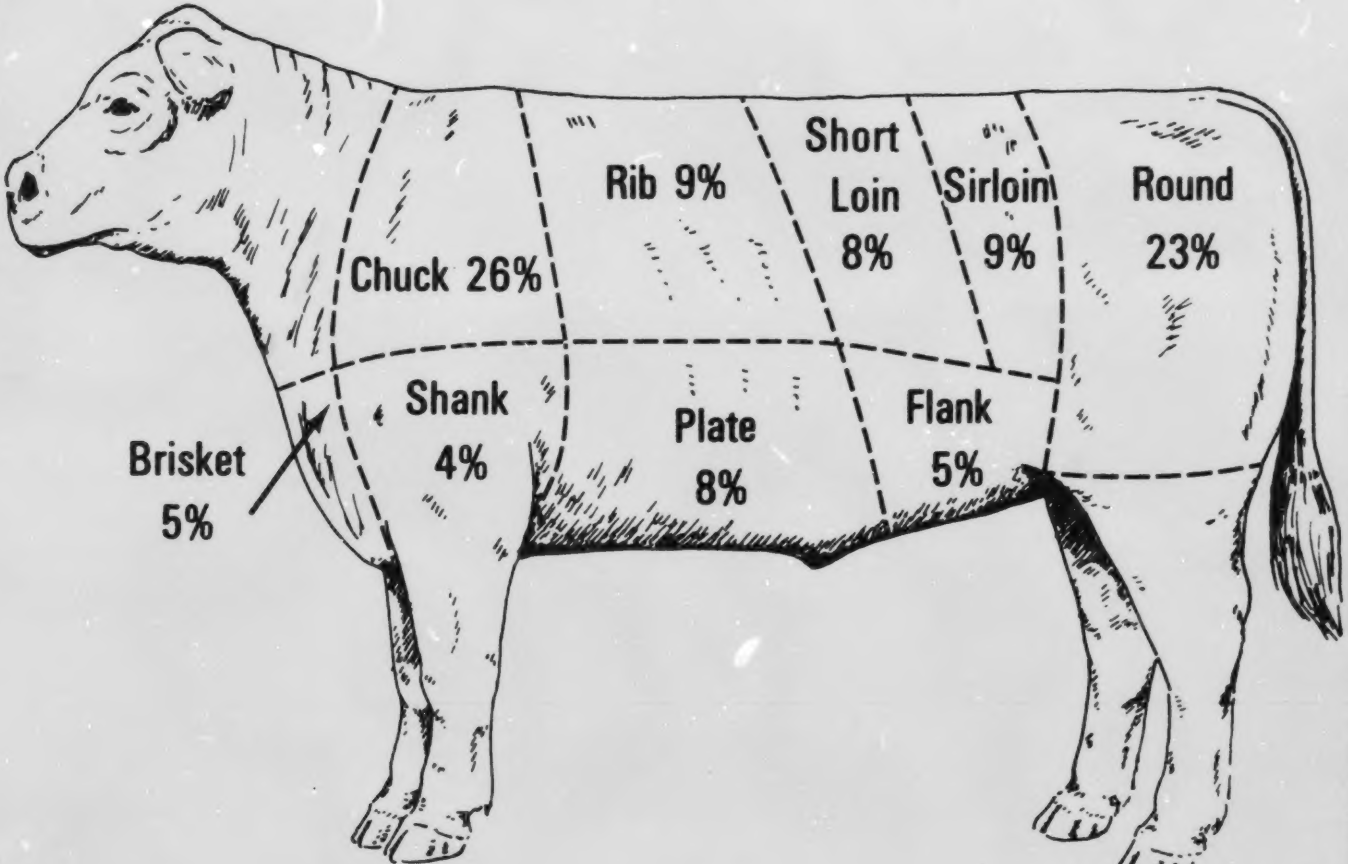
Wholesale Cuts of Pork


Blade
Loin Roast
Tenderloin
Sausage
Boston
Butt Ham
Blade Steak
Blade
Chop
Loin Chop
Canadian
Bacon
Boston
Butt
Back
Loin
Rump
Jowl
Picnic
Side
Ham
Bacon
Sausage
Ham
(butt half)
Ham
(shank half)
Ham Roast
Arm Roast
Picnic Ham
Arm
Steak
Salt Pork
Spareribs
Bacon

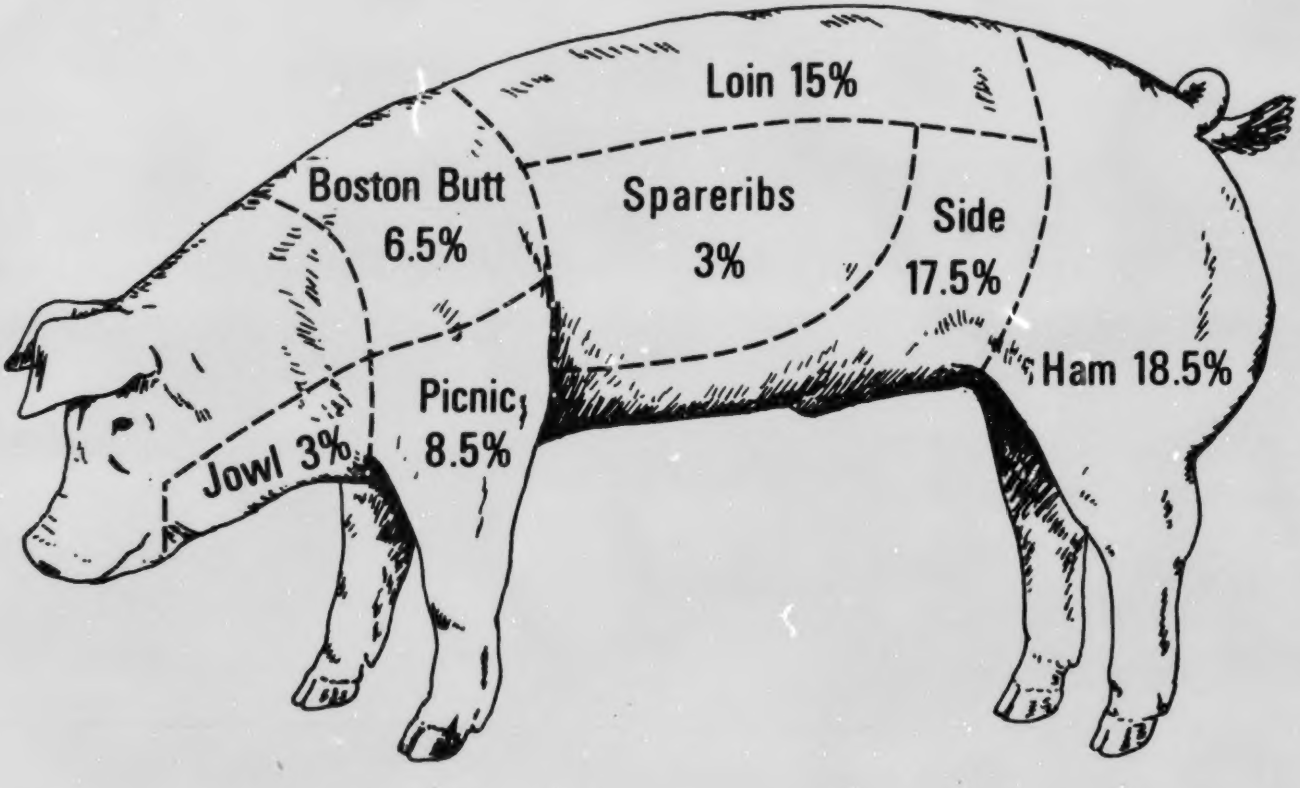
Wholesale Cuts of Lamb


Sirloin Roast
Sirloin Chop
Loin Roast
Loin Chop
Rib Roast
Rib Chop
Shank-Leg of Lamb
Leg Steak
Ground Lamb
Square Shoulder
Arm Chop
Sirloin
Loin
Rack
Shoulder
Leg
Breast
Fore Shank
Breast
Stuffed Breast
Fore Shank Roast

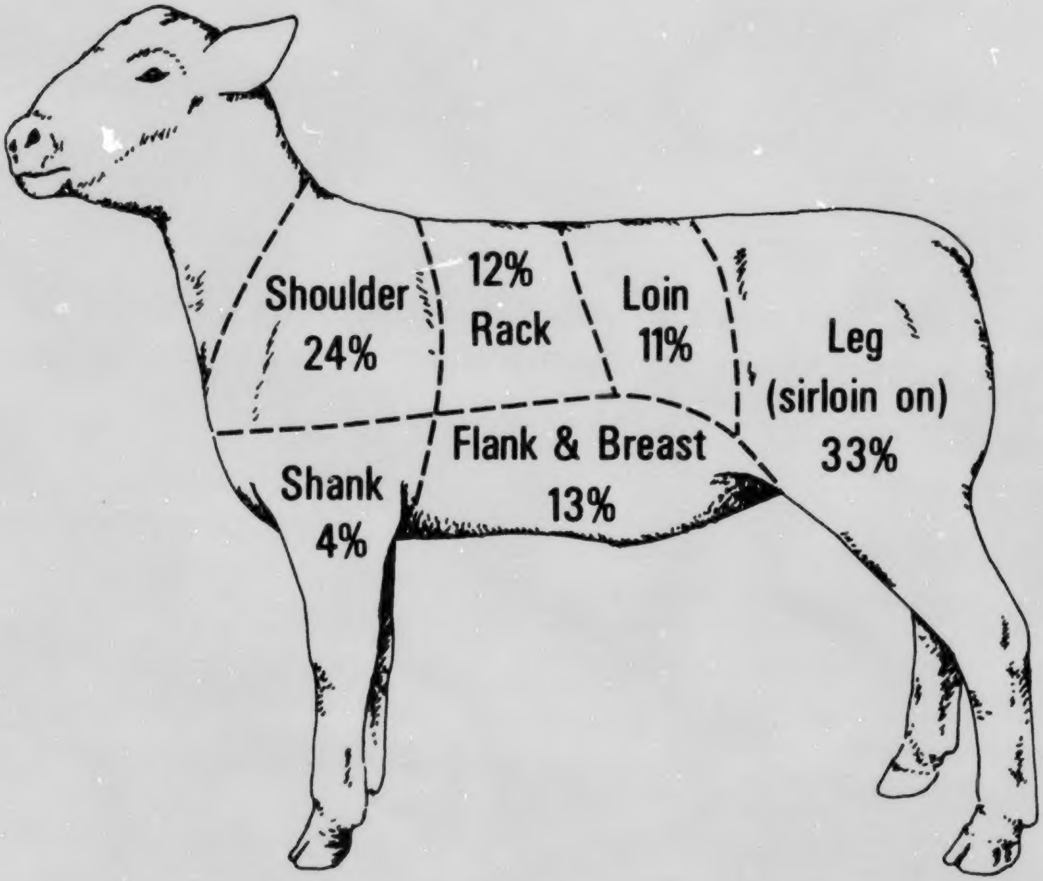
Approximate Yield Percentage of a Beef Carcass


Chuck 26%
Rib 9%
Short Loin 8%
Sirloin 9%
Round 23%
Brisket 5%
Shank 4%
Plate 8%
Flank 5%

Approximate Yield Percentage of a Swine Carcass


Loin 15%
Boston Butt 6.5%
Spareribs 3%
Side 17.5%
Ham 18.5%
Picnic 8.5%
Jowl 3%

Approximate Yield Percentage of a Lamb Carcass


Shoulder
24%
12%
Rack
Loin
11%
Leg
(sirloin on)
33%
Shank
4%
Flank & Breast
13%

LIVESTOCK SELECTION
UNIT III

TEST

1. Match the terms on the right with the correct definition.

______a. Overall smoothness, blending of shoulders, and refinement of head and bone

______b. Evidence of vigor or "doing ability" denoted by depth and fullness of heart, spring of ribs, width of chest floor, and substance of bone

______c. Combination of characteristics which indicate the female will be a good mother

______d. Traits distinguishing a male from a female

______e. General term commonly defined as a combination of characteristics which make an animal most useful for a specific purpose

______f. Freedom of excess finish or fat

______g. Condition of having size and weight for age

______h. Traits which denote one breed from another

______i. Proper proportions and blending of parts

______j. Ability of an animal to "hold itself together" as indicated by strength of top, tightness of shoulders, and squareness of feet and by leg placement

______k. Size of the animal as determined by skeletal structure

1. Type
2. Balance of symmetry
3. Meatiness or muscling
4. Quality
5. Trimness
6. Tight-framed
7. Soundness
8. Constitution
9. Growthiness
10. Scale
11. Ruggedness
12. Broodiness
13. Breed character
14. Femininity
15. Masculinity

_____l. Traits distinguishing a female from a male

_____m. High proportion of volume in the areas of the high priced cut

_____n. Quality of being correct on the feet and legs as opposed to unsound

_____o. Quality of having largs bones and frame.

2. List three steps in the livestock selection process.

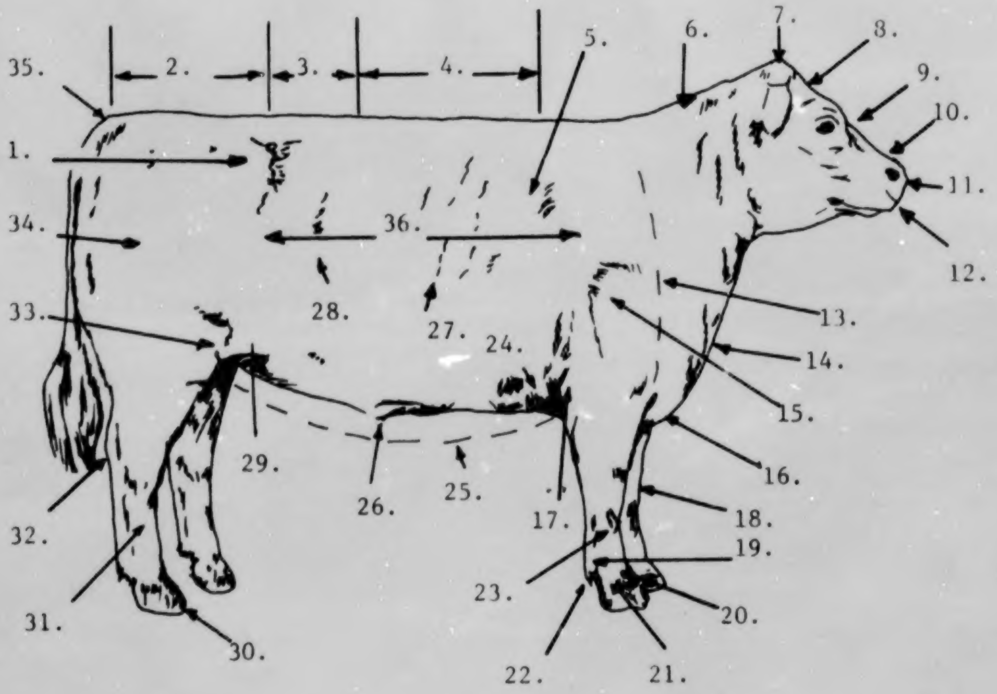
   a.

   b.

   c.

3. Identify the parts of a beef, swine, sheep, and dairy animal.

a. Beef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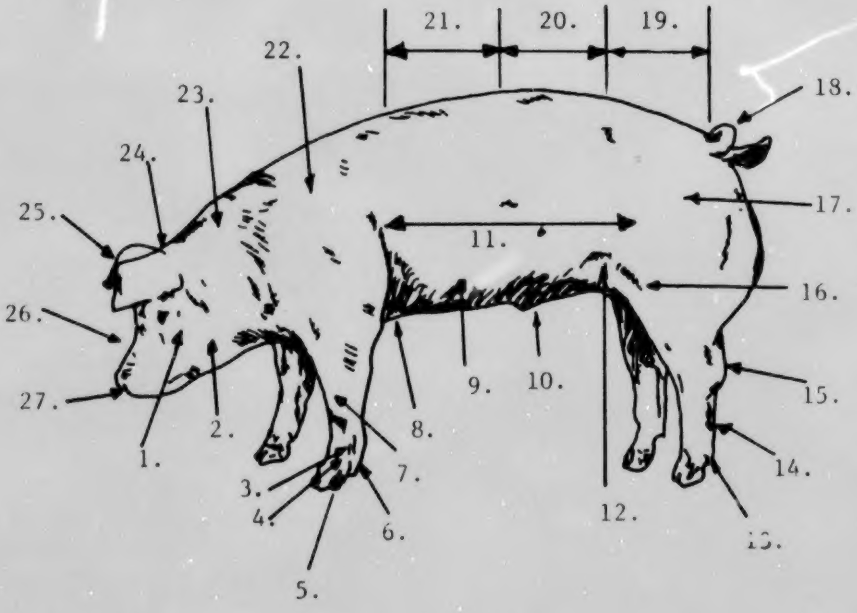
36. ________________

b. Swine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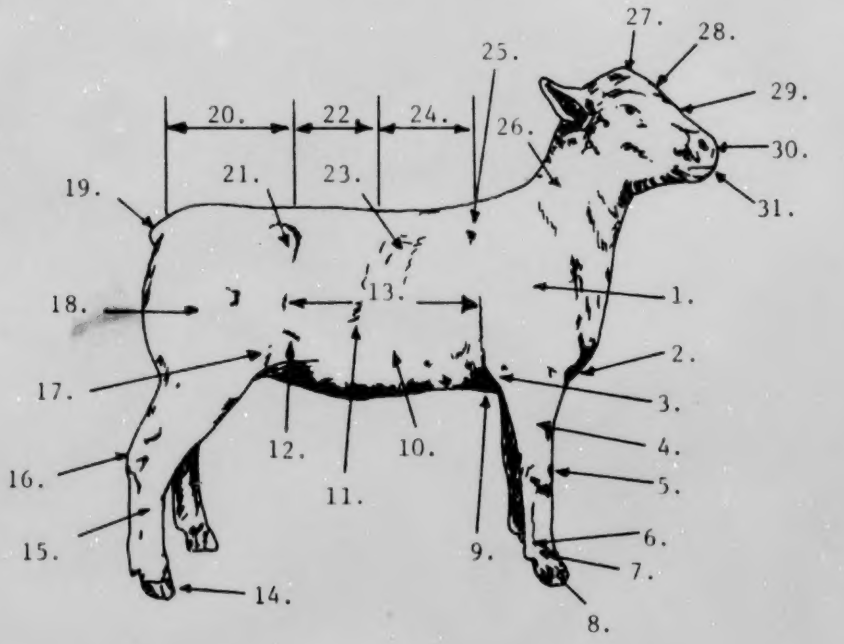
27. ______________________________

c. Sheep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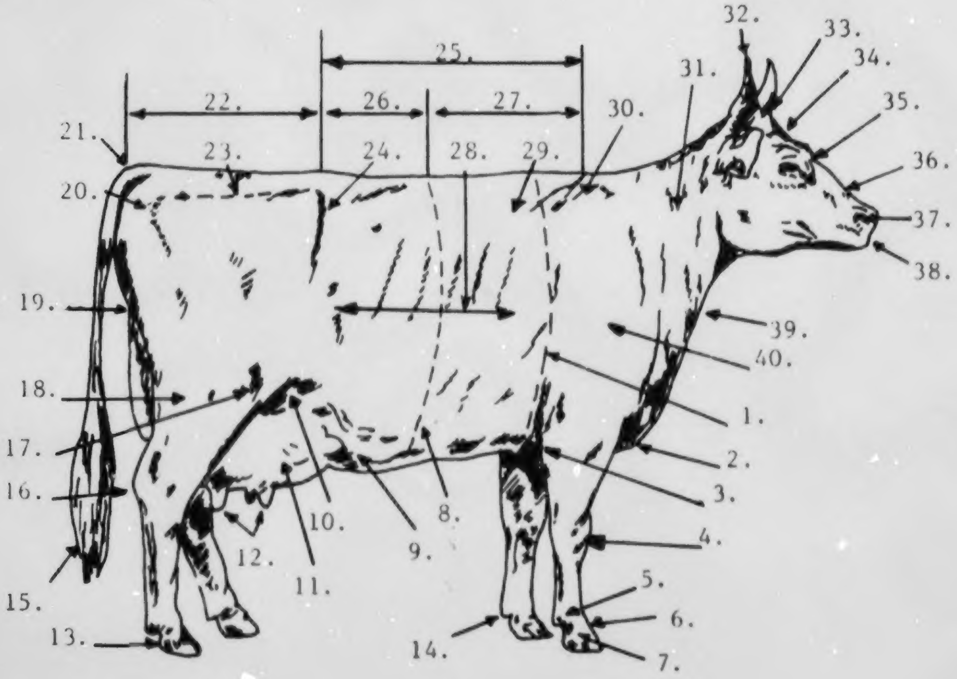
31. ______________

d. Dairy cow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e. Label parts of the horse

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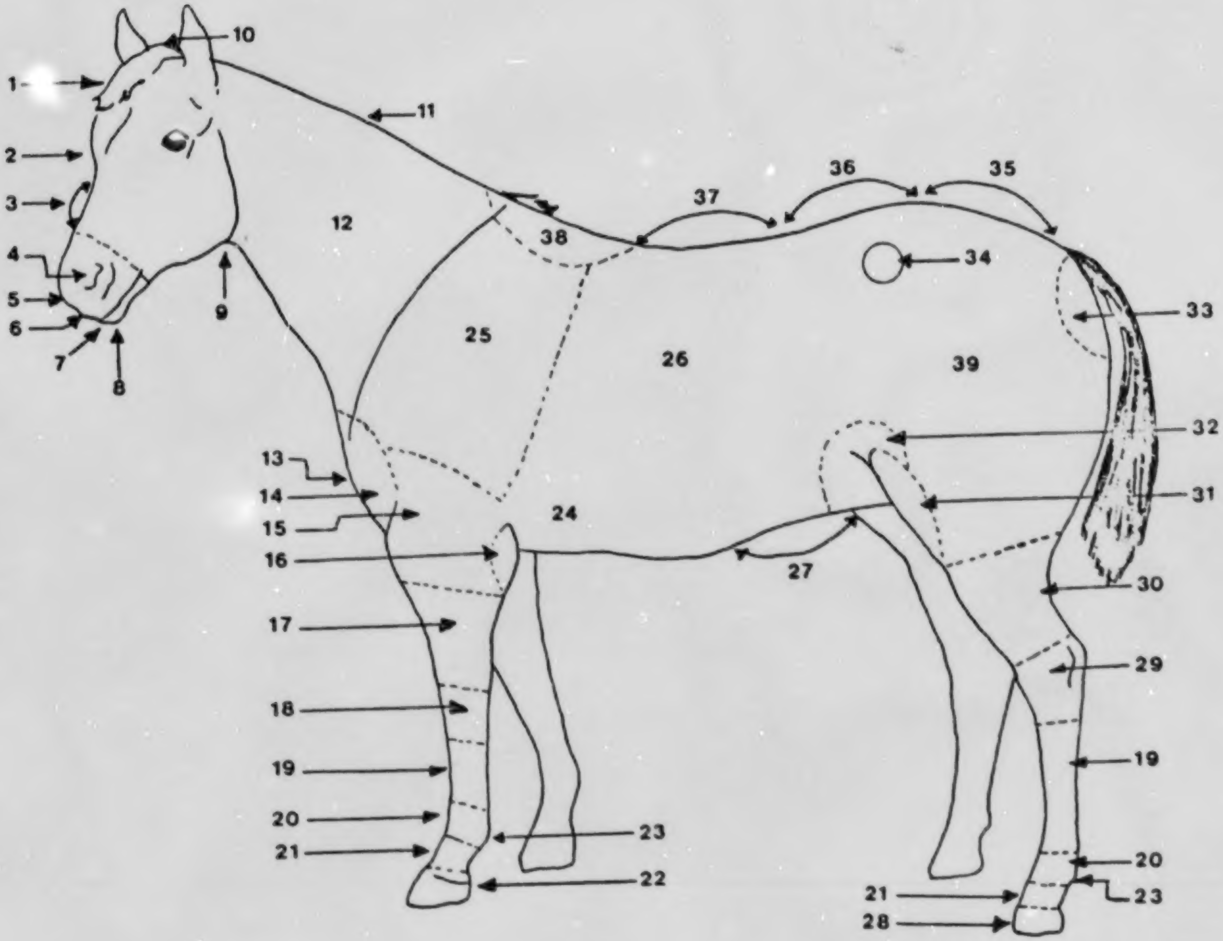
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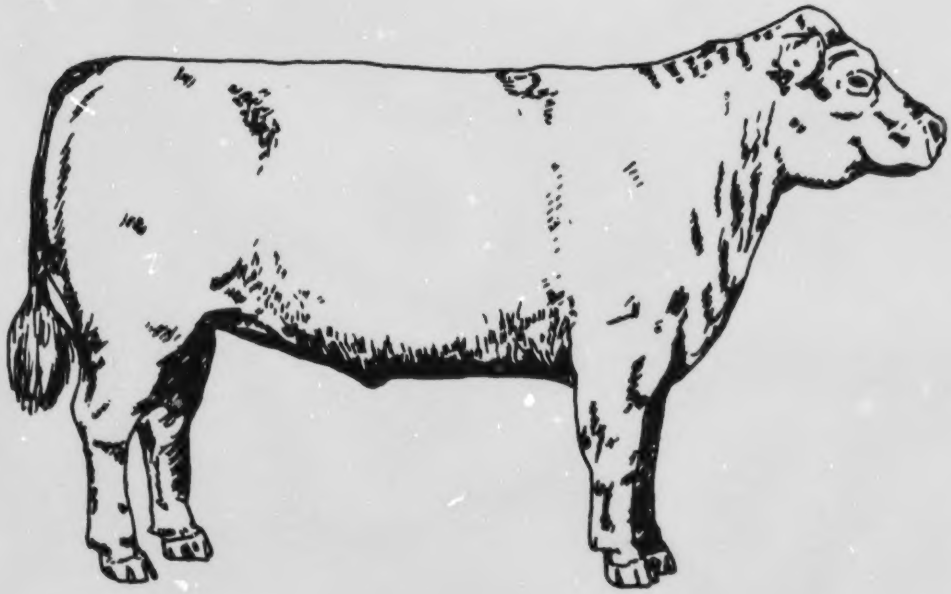
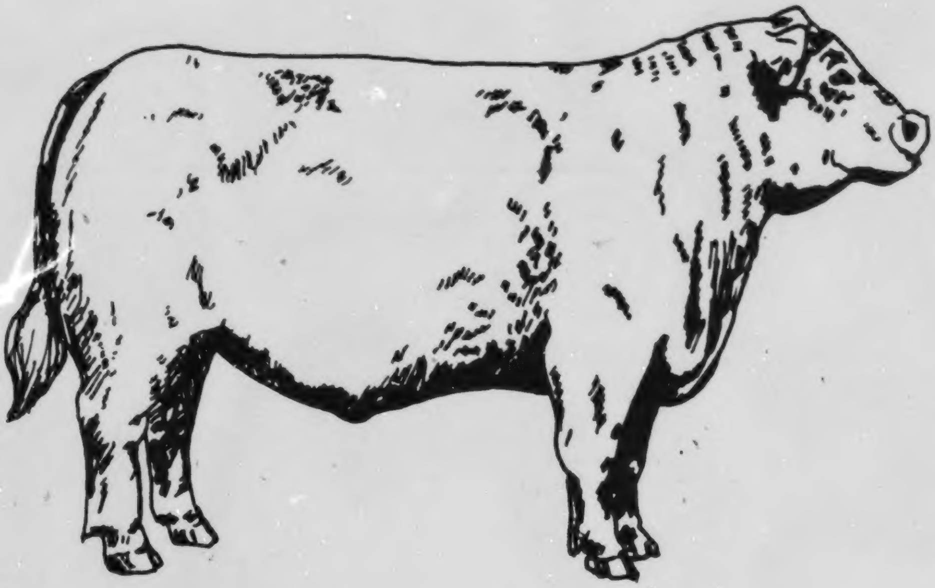
4. Identify the following animals as being desirable and undesirable by writing the words under the appropriate picture.

a. Beef

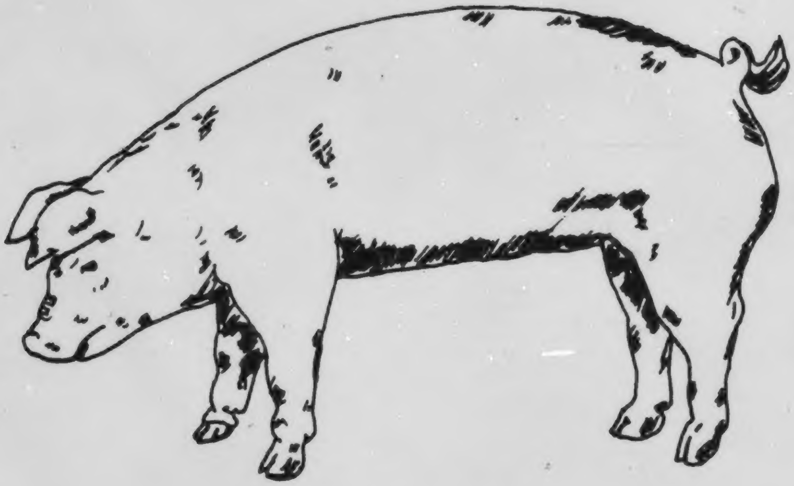


1. ____________________

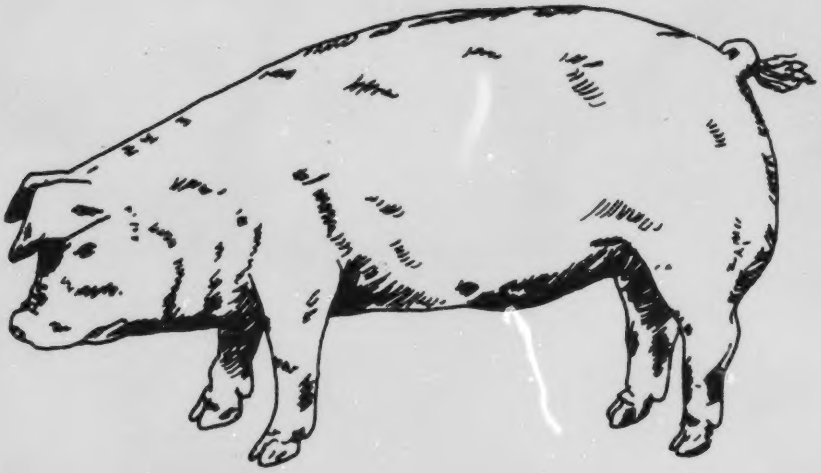


2. ____________________

b. Swine

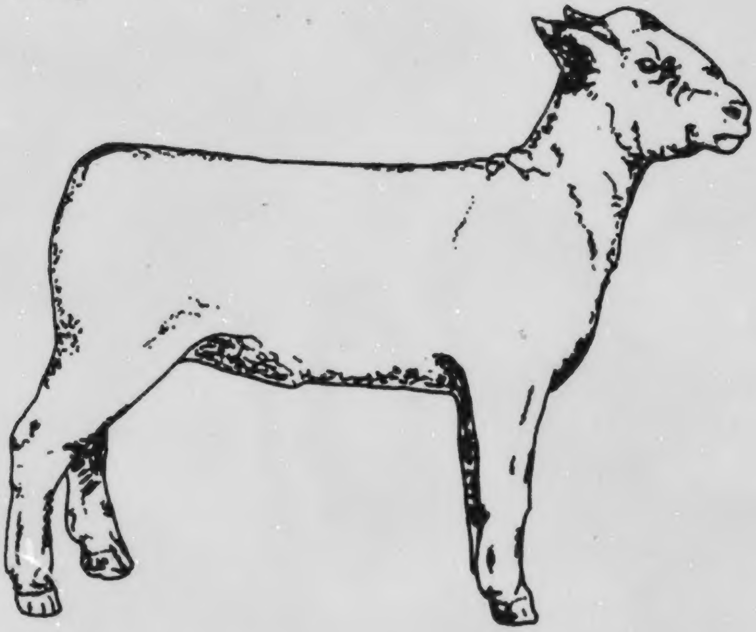


1.________________________

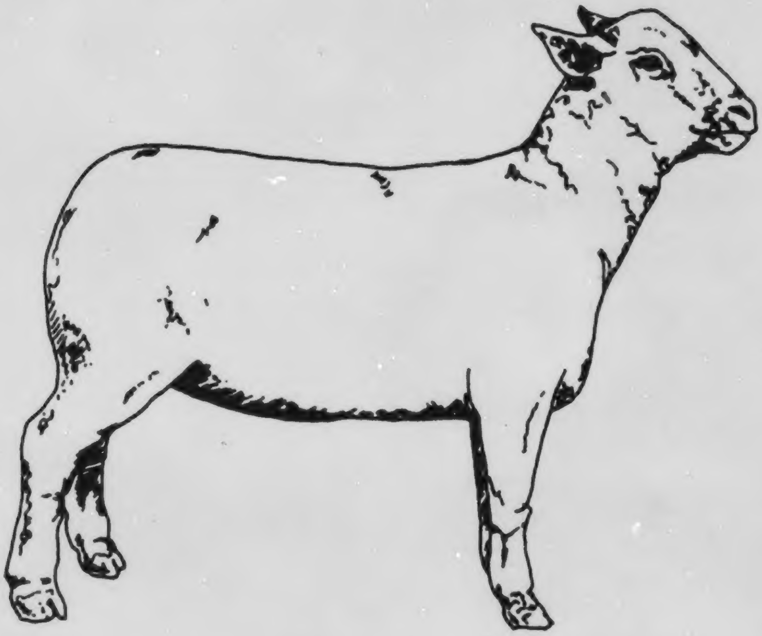


2.________________________

c. Sheep

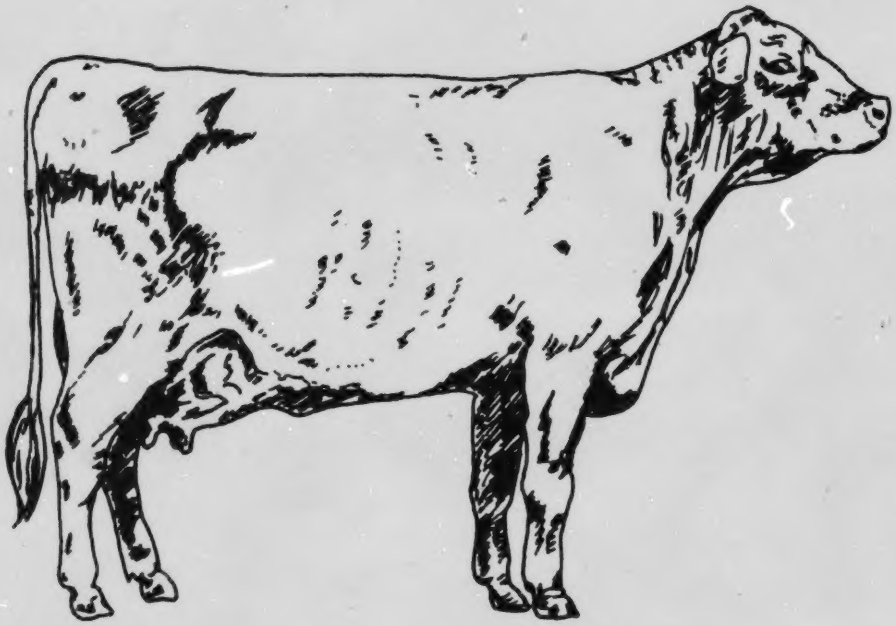


1.______________________

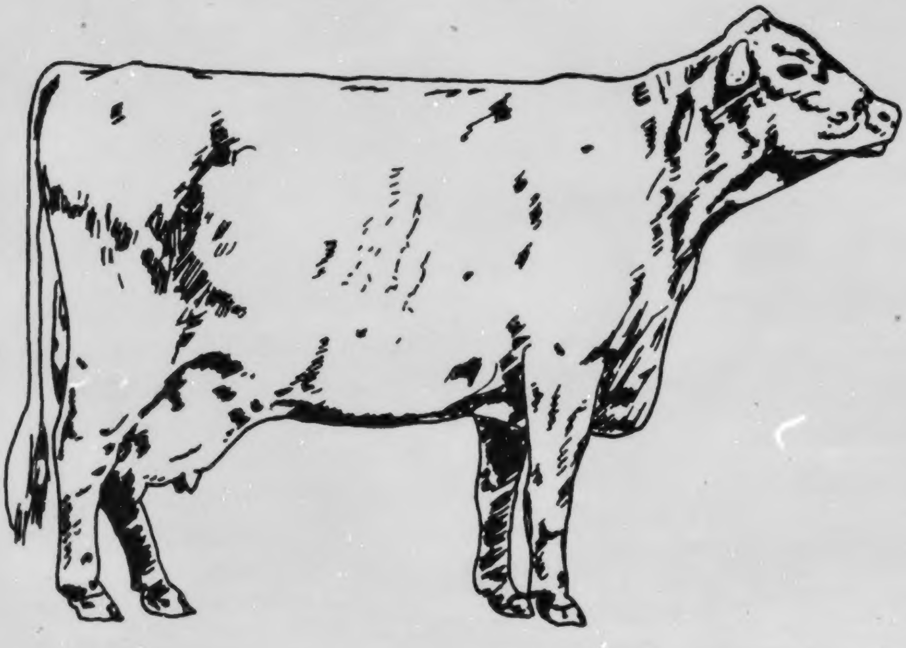


2.______________________

d. Dairy cow



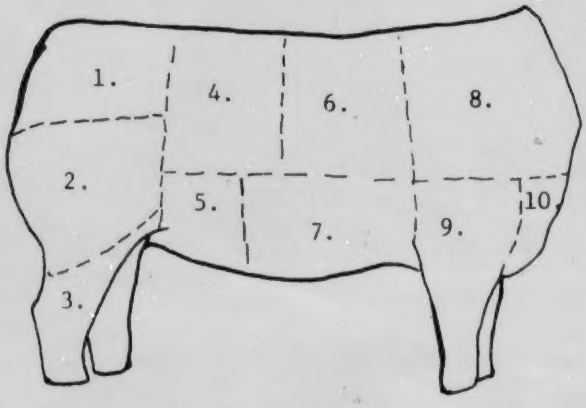
1: ______________________



2. ______________________

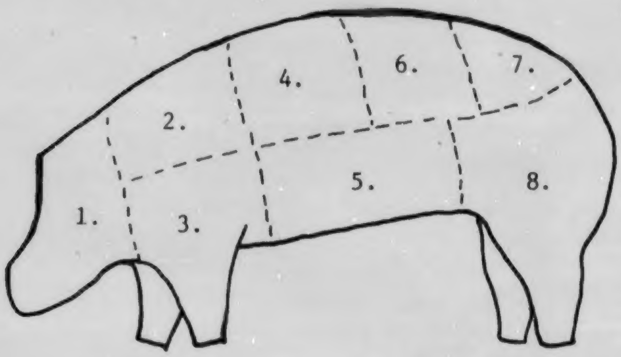
5. Identify the wholesale cuts of these animals.

a. Beef


1.
4.
6.
8.
2.
5.
7.
9.
10
3.

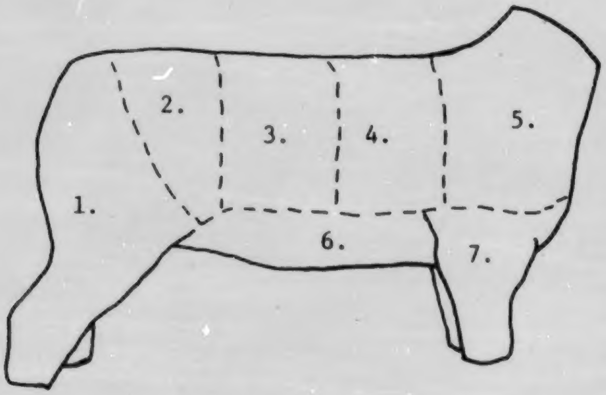
1. ________________________
2. ________________________
3. ________________________
4. ________________________
5. ________________________
6. ________________________
7. ________________________
8. ________________________
9. ________________________
10. ________________________

b. Swine



1. ________________________
2. ________________________
3. ________________________
4. ________________________
5. ________________________
6. ________________________
7. ________________________
8. ________________________

c. Sheep



1. ________________________
2. ________________________
3. ________________________
4. ________________________
5. ________________________
6. ________________________
7. ________________________

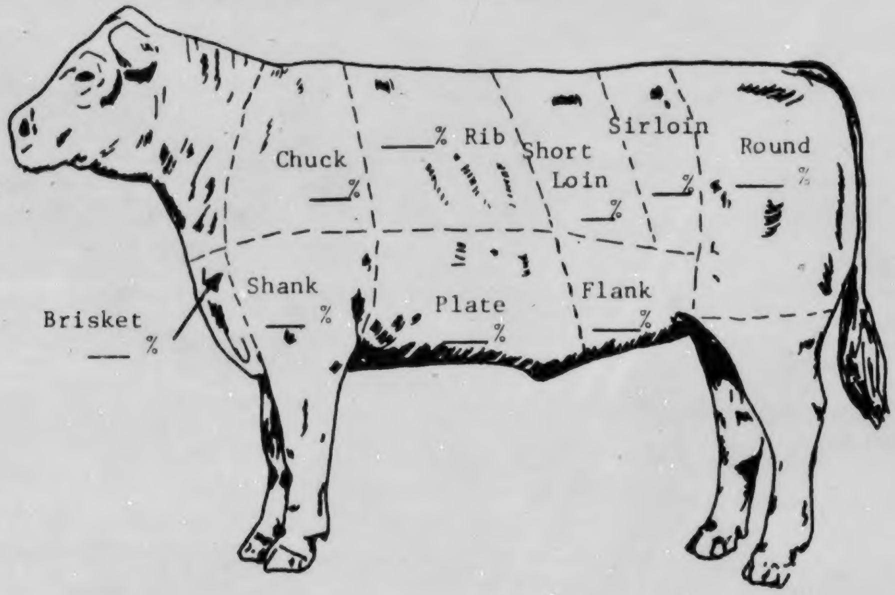
6. Match the approximate percentage of yield to the name of the wholesale cut by writing it in the blank on the picture below.

   a. Beef

   23% 5% 4%

   9% 26% 5%

   8% 9% 8%


Chuck
___%
___% Rib
Short Loin
___%
Sirloin
___%
Round
___%
Brisket
___%
Shank
___%
Plate
___%
Flank
___%

b. Sheep

16%

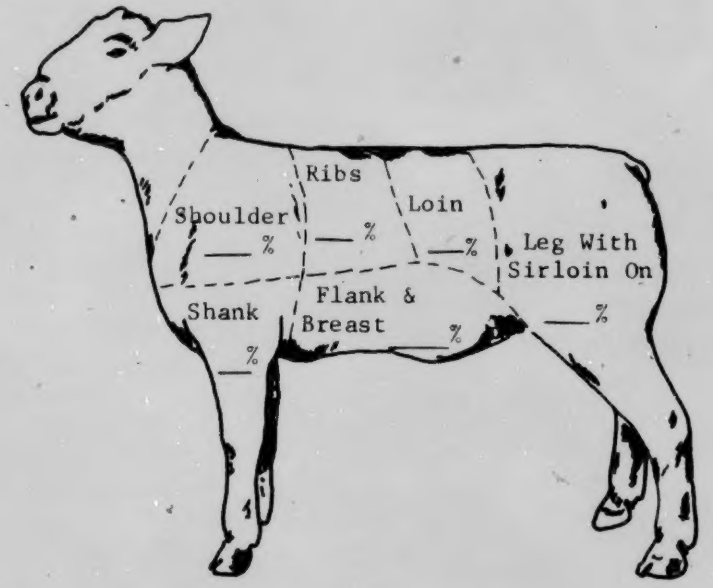
4%

12%

24%

33%

11%


Shoulder
___ %
Ribs
___ %
Loin
___ %
Leg With Sirloin On
___ %
Shank
___ %
Flank & Breast
___ %

c. Swine

18.5%

17.5%

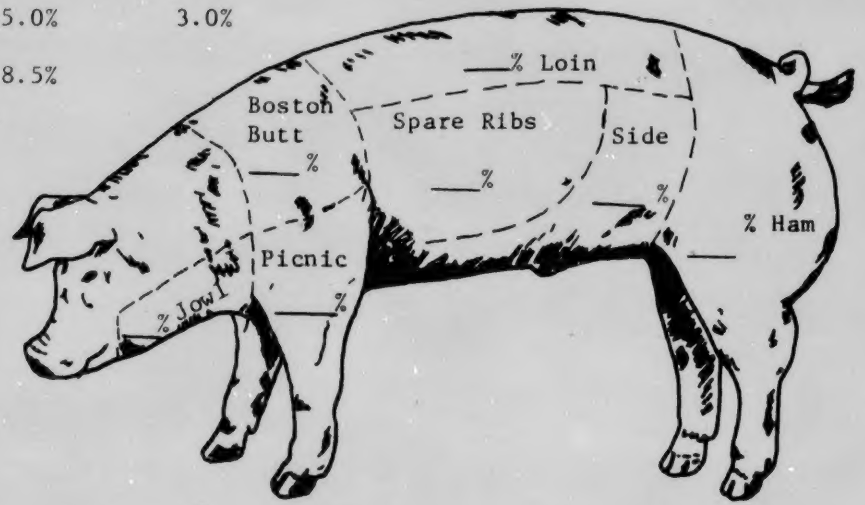
15.0%

8.5%

6.5%

3.0%

3.0%


___ % Loin
Boston Butt
___ %
Spare Ribs
___ %
Side
___ %
% Ham
___
Picnic
___ %
% Jowl

7. Write ten comparative advantages and ten criticism terms as used in selection of livestock.

Comparative advantage terms

1)

2)

3)

4)

5)

6)

7)

8)

9)

10)

Criticisms

1)

2)

3)

4)

5)

6)

7)

8)

9)

10)

8. Write a sample set of reasons on a class of__________________________.
(class and placing to be completed by instructor)

LIVESTOCK SELECTION
UNIT III

ANSWERS TO TEST

1. a. 4
b. 8
c. 12
d. 15
e. 1
f. 5
g. 9
h. 13
i. 2
j. 6
k. 10
l. 14
m. 3
n. 7
o. 11

2. a. Know the parts of the live animal
b. Know the wholesale cuts of the animal
c. Know what the ideal animal looks like

3. a. Beef

1) Hooks
2) Rump
3) Loin
4) Back
5) Crops
6) Neck
7) Poll
8) Forehead
9) Face
10) Nose
11) Nostril
12) Muzzle
13) Shoulder vein
14) Dewlap
15) Shoulder
16) Brisket
17) Elbow
18) Knee
19) Fetlock
20) Pastern
21) Coffin
22) Dewclaw
23) Shank
24) Fore flank
25) Underline
26) Sheath
27) Ribs
28) Last rib (13th)
29) Flank
30) Hoof
31) Shank (cannon bone)
32) Hock
33) Stifle
34) Quarter
35) Tail head
36) Body

b. Swine

1) Cheek
2) Jowl
3) Fetlock
4) Pastern
5) Coffin
6) Foreleg
7) Knee
8) Fore flank
9) Belly
10) Sheath
11) Side
12) Hind flank
13) Dewclaw
14) Hindleg
15) Hock
16) Stifle
17) Ham
18) Tail
19) Rump (hip)
20) Loin
21) Back
22) Shoulder
23) Neck
24) Poll
25) Ear
26) Snout
27) Nostril

c. Sheep

1) Shoulder
2) Breast
3) Elbow
4) Fore shank
5) Knee
6) Fetlock
7) Pastern
8) Coffin
9) Fore flank
10) Belly
11) Last rib
12) Rear flank
13) Body
14) Hoof
15) Cannon bone
16) Hock
17) Stifle
18) Leg of lamb
19) Dock
20) Rump
21) Hip
22) Loin
23) Ribs
24) Back or rack
25) Top of shoulder
26) Neck
27) Poll
28) Forehead
29) Face
30) Nose
31) Mouth

d. Dairy cow

1) Heart girth
2) Brisket
3) Elbow
4) Knee
5) Fetlock
6) Pastern
7) Coffin
8) Barrel
9) Mammary veins
10) Flank
11) Udder
12) Teats
13) Hoof
14) Dewclaw
15) Switch
16) Hock
17) Stifle
18) Thigh
19) Rear udder attachment
20) Pin bones
21) Tail head
22) Rump
23) Thurl
24) Hip
25) Back
26) Loin
27) Chine
28) Ribs
29) Crops
30) Withers
31) Neck
32) Horn
33) Poll
34) Forehead
35) Face
36) Nose
37) Nostril
38) Muzzle
39) Dewlap
40) Shoulder

e. Horse

1) Forehead
2) Face
3) Bridge of nose
4) Nostril
5) Muzzle
6) Upper lip
7) Lower lip
8) Under lip
9) Throat latch
10) Poll
11) Crest
12) Neck
13) Point of shoulder
14) Chest
15) Arm
16) Elbow
17) Forearm
18) Knee
19) Cannon
20) Ankle
21) Pastern
22) Coronet
23) Fetlock
24) Girth
25) Shoulder
26) Barrel
27) Abdomen
28) Hoof
29) Hock
30) Gaskin
31) Stifle
32) Flank
33) Buttock
34) Point of hip
35) Croup
36) Loin
37) Back
38) Withers
39) Thigh

4. a. Beef

1) Desirable

2) Undesirable

b. Swine

1) Desirable

2) Undesirable

c. Sheep

1) Desirable

2) Undesirable

d. Dairy cow

1) Desirable

2) Undesirable

5. a. Beef

1) Rump

2) Round

3) Shank

4) Loin

5) Flank

6) Rib

7) Plate

8) Chuck

9) Fore shank

10) Brisket

b. Swine

1) Jowl

2) Boston butt

3) Picnic

4) Back

5) Side

6) Loin

7) Rump

8) Ham

c. Sheep

1) Leg

2) Sirloin

3) Loin

4) Rack

5) Shoulder

6) Breast

6. a. Beef

Brisket--5%

Chuck--26%

Rib--9%

Short loin--8%

Sirloin--9%

Round--23%

Flank--5%

Plate--8%

Shank--4%

b. Sheep

Shank--4%

Breast and flank--13%

Leg (Sirloin on)--33%

Loin--11%

Rack--12%

Shoulder--24%

c. Swine

Jowl--3%

Picnic--8.5%

Spareribs--3%

Side--17.5%

Ham--18.5%

Loin--15%

Boston butt--6.5%

7. Any ten comparative advantages and criticism terms listed under #7 on information sheet for either beef, swine, or sheep.

8. Evaluated to the satisfaction of the instructor.

LIVESTOCK FEEDING
UNIT IV

TERMINAL OBJECTIVES

After completion of Unit IV, the student should be able to define terms associated with livestock feeding, identify the characteristics of feedstuffs, and plan feeding programs for different classes of livestock. He should also be able to balance rations for the different classes using various methods. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with livestock feeding to the correct definition.
2. Name the approximate percentage of composition of farm animals.
3. Match functions of a simple digestive system with the correct part of the system.
4. List four main parts of the ruminant stomach.
5. List six classes of nutrients.
6. List functions of water in the animal body.
7. Name five purposes of a ration.
8. Select from a list the characteristics of a good ration.
9. List the characteristics of major grains used as feedstuffs.
10. List the composition of a good ration.
11. Name two thumb rules for feeding livestock.
12. Balance a ration for protein content using the square method.

LIVESTOCK FEEDING
UNIT IV

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information and assignment sheets
3. Make transparencies.
4. Discuss terminal and specific objectives
5. Discuss information and assignment sheets
6. Give test

(NOTE: Instructors may want to secure feed tags of various feeds for students to analyze.)

Student:

1. Read objective sheet
2. Study information sheet and take notes
3. Complete assignment sheet
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheet
3. Transparency masters
    - TM 1--Composition of Farm Animals
    - TM 2--Parts of a Simple Digestive System
    - TM 3--Parts of a Ruminant Digestive System
4. Assignment #1--Balance a Ration Using the Pearson Square Method
5. Test
6. Answers to test

References:

1. Animal Science. Columbia, Missouri: Missouri State Department of Education, Agricultural Education, University of Missouri.

2. Ensminger, M.E. The Stockman's Handbook. Danville, Illinois: Interstate Publishers and Printers, 1962.

3. Bundy, C.E. and Ronald V. Diggins. Livestock and Poultry Production. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1961.

4. Morrison, Frank B. Feeds and Feeding. Clinton, Iowa: The Morrison Publishing Co., 1959.

5. Cassard, Daniel W. and Elwood M. Juergenson. Approved Practices in Feeds and Feeding. Danville, Illinois: Interstate Printers and Publishers, 1963.

6. General Facts on Livestock Feeding. Urbana, Illinois: College of Agriculture, Vocational Agriculture Science. University of Illinois.

7. Richardson, Curtis W. OSU Extension Facts. "Feeding Dariy Replacement Heifers." Stillwater, Oklahoma: Oklahoma State Universtiy.

8. Stevens, Vernon, William G. Luce, and Don R. Gill. OSU Extension Facts, "Swine Nutrition." Stillwater, Oklahoma: University of Oklahoma.

9. Luce, William G. OSU Extension Facts, "Managing the Sow and Litter," Stillwater, Oklahoma: Oklahoma State Universtiy.

10. Allen, Dell M.; Hines, Robert H.; McKee, Miles. AS & I Lab Manual, Kansas State University, 1971.

LIVESTOCK FEEDING
UNIT IV

INFORMATION SHEET

I. Terms and definitions

A. Ration--Feed necessary for a given animal for 24 hours

B. Balanced ration--Ration which supplies all the necessary nutrients in proper proportions for a period of 24 hours

C. Nutrient--Single class of food that aids in support of life

D. Digestible nutrient--That portion of a nutrient which may be digested and absorbed by the animal

E. Digestion--Process which breaks down food before absorption into the body

F. Mastication--Chewing of food by an animal

G. Concentrate--Feed high in total digestible nutrients and low in fiber

Example: At least 75% TDN and not more than 15% fiber

H. Roughage--Feed high in fiber and low in total digestible nutrients

I. Ruminant--Animal that has more than one compartment in his stomach

J. Simple stomach animal--One that has only one stomach

K. Crude protein--Nitrogen containing compounds in feed

L. Digestible protein--Amount of crude protein in a feed that can be digested by the animal

(NOTE: As a general rule digestible protein is about 80% of crude protein.)

M. Absorption--Passing of food materials from digestive tract into the body after they are digested and dissolved

N. Bloom--Healthy appearance indicating that the animal is doing well on feed

O. Feces--Waste material of animals (manure)

P. Protein--Nutrient which supplies materials for body growth

Q. Palatable feed--A feed that is tasty to animals

R. Animo acids--Building blocks of protein

INFORMATION SHEET

S. Total digestible nutrients--Proportion of a feed which is usable to supply energy to the animal

T. Fiber--Tough part of feed which is not very digestible

II. Composition of farm animals (Transparency 1)

III. Parts and functions of a simple digestive system (Transparency 2)

A. Mouth

1. Chewing

2. Secretion of saliva

B. Esophagus--Passageway to stomach

C. Stomach

1. Hydrochloric acid added

2. Absorption begins

D. Small intestine

1. Enzymes added

2. Pancreatic juices added

E. Large intestine--Water absorbed

F. Anus--Passageway to expel waste

IV. Major parts of the ruminant stomach (Transparency 3)

(NOTE: Cattle, sheep, and goats are ruminants.)

A. Rumen (paunch)

1. Holding vat

2. Starts bacterial breakdown

B. Reticulum (known as hardware stomach)

1. Forepart of rumen

2. Acts as a filter to keep large particles of feed from passing from rumen

INFORMATION SHEET

C. **Omasum**

   1. Grinds feed
   2. Squeezes out water

D. Abomasum (true stomach)

   1. Adds digestive juices
   2. Functions similar to simple stomach

V. Classes of nutrients

   A. Carbohydrates

      Examples: 1. Corn
      2. Oats
      3. Barley
      4. Milo
      5. Wheat

   B. Proteins

      Examples: 1. Soybean meal
      2. Cottonseed meal
      3. Linseed meal
      4. Tankage and meat scraps
      5. Fish meals

   C. Fats

   D. Minerals

      Examples: 1. Calcium
      2. Phosphorous
      3. Potassium
      4. Salt

INFORMATION SHEET

E. Vitamins

Examples:
1. Vitamin A
2. Vitamin B complex
3. Vitamin D
4. Vitamin E
5. Vitamin K
6. Vitamin C

F. Water

VI. Functions of water

(NOTE: Water is the most important nutrient.)

A. Important element in the blood

B. Dissolves feed

C. Regulates body temperature

D. Removes body waste

E. Transports feed

VII. Purposes of a ration

A. Maintenance

B. Growth

C. Finishing

D. Production

E. Reproduction

VIII. Characteristics of a good ration

A. Available

B. Economical

C. Palatable

D. Causes no harmful effects

INFORMATION SHEET

E. Contains proper proportion of roughage and concentrates

F. Provides essential amino acids, vitamins, and minerals

(NOTE: Swine rations must contain all the essential amino acids. However, ruminants can manufacture many of the essential amino acids used in the animal body.)

IX. Characteristics of major grains used as feedstuffs

A. Corn

1. 80% total digestible nutrients (TDN)
2. High in fat
3. Yellow or white in color
4. Deficient in protein and mineral

B. Oats

1. 70% TDN
2. Low quality feed
3. Low in protein
4. High fiber content in hulls

C. Barley

1. Good corn substitute
2. High in carbohydrates

D. Wheat

1. High in TDN
2. High in protein

E. Rye

1. Less palatable to livestock
2. Mixes with other feeds

F. Milo and grain sorghums

1. 70% TDN
2. Low quality protein

INFORMATION SHEET

X. Composition of a good ration

- A. Concentrate and roughage
- B. Protein in sufficient amount and quality
- C. Minerals in proper amounts
- D. Vitamins in proper amounts

XI. Thumb rules in feeding livestock

- A. Swine
    1. Nursing sows--Three pounds of grain per 100 pounds of live weight per day
    2. Fattening--Four pounds of grain supplement per 100 pounds of live weight per day
    3. 350 pounds of grain and supplement to produce 100 pounds of live weight
- B. Dairy
    1. Cows (in production)
        - a. Two pounds of roughage per 100 pounds of live weight
        - b. One pound of hay and three pounds of silage per 100 pounds of live weight
        - c. One pound of concentrate per day for each three to four pounds of milk produced
    2. Cows (dry)
        - a. Good condition--Two to four pounds of concentrates and good roughage
        - b. Poor condition--Five to six pounds of concentrates and good roughage
- C. Beef
    1. Winter feeding cows on grass pasture
        - a. Five to seven pounds of good quality alfalfa hay
        - b. Two pounds of 41% protein supplement
        - c. Four pounds of 20% protein supplement
        - d. Three pounds of 32% protein supplement

INFORMATION SHEET

2. Conventional creep ration

a. Sixty pounds of cracked or rolled milo or corn	5.6% P
b. Thirty pounds of whole oats	3.6% P
c. Ten pounds of cottonseed meal	4.1% P
Total	13.3% P

D. Sheep

1. Ewes

    a. With winter pasture--One pound of grain, one pound of dry hay

    b. Without winter pasture--One pound of grain, three pounds of dry hay

2. Rams

    a. With dry grass pasture--Two pounds of alfalfa hay

    b. One pound of grain daily

XII. Balancing a ration using the square method

A. Draw a square with diagonal dotted lines

B. Place the desired protein level of the ration in the center of the square

C. Place the percentage protein on the two feeds being used at the top and bottom left corners

D. Substract following the dotted lines

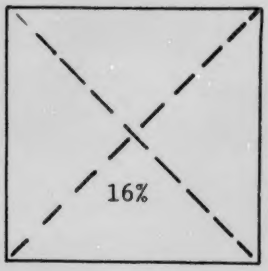
E. Look for the results, directly across the square, which indicate the number of parts of each feed needed in the ration to balance it

F. Total the parts of feed needed

INFORMATION SHEET

G. Divide total parts into grain and protein parts to get the respective percentage of each

Example:

	Pearson's Square	Parts	Percentage
soybean meal 44%		4.7 protein supplement	14% protein supplement
milo 11.3%		28 parts of home grown feed	86% milo
	Total	32.7 total parts	100% ration

(NOTE: Do Assignment Sheet #1.)

Sample rations:

A. Swine

1. 18% ration

Ingredients		Pounds
Corn		600
Milo		600
Oats		120
Soybean meal (44%)		488
Whey		200
Tylan		5
	Total	2,013

2. 16% ration

Ingredients		Pounds
Corn		650
Milo		650
Oats		120
Soybean meal		388
Whey		200
Tylan (20 gram level)		5
	Total	2,013

INFORMATION SHEET

3. 18% baby pig ration

Ingredients	Pounds
Corn	600
Milo	600
Oats	120
Soybean meal (44%)	488
Whey	200
Tylan	5
Sugar	200
Total	2,213

(NOTE: The above rations were made available by Mr. Jim Rucker, Vocational Agriculture instructor, Moore, Oklahoma.)

4. Sow ration

Ingredients	Pounds
Milo (ground)	1,565
Soybean meal (44%)	280
Alfalfa meal	100
Di-calcium phosphate	30
Calcium carbonate	15
Salt (iodized)	10
Vitamins (Premix according to manufacturer's recommendation)	
Total	2,000

5. Confinement ration

a. 17.5% protein mix

Ingredients	Pounds
Wheat	1,111.5
Milo	1,111.5
Soybean meal (44%)	634.5
Molasses	45.0
Di-calcium (hi-quality)	33.0
Limestone (hi-quality)	31.5
Salt (trace minerals)	15.0
(Premix according to manufacturer's recommendation)	
Total	2, 981.0

(NOTE: Feed until pigs weigh 75-80 lbs. Use for pigs weighing less than 55 lbs.)

INFORMATION SHEET

b. 16% protein mix

Ingredients	Pounds
Wheat	1,141.5
Milo	1,141.5
Soybean meal (44%)	574.5
Di-calcium (hi-qualtiy)	33.0
Limestone (hi-qualtiy)	31.5
Salt (trace minerals)	15.0
Molasses	45.0
(Premix according to manufacturer's recommendation)	
Total	2,982.0

(NOTE: This ration may be used following the 17.5% ration. This ration is suggested to start pigs on when weighing 55-60 lbs. Feed until pigs weigh 125 lbs.)

c. 15% protein mix

Ingredients	Pounds
Wheat	1,201.5
Milo	1,201.5
Soybean meal	454.5
Molasses	45.0
Di-calcium (hi-quality)	33.0
Limestone (hi-qualtiy)	31.0
Salt (trace minerals)	15.0
(Premix according to manufacturer's recommendation)	
Total	2,981.5

(NOTE: Start feeding when pigs weigh 80 lbs., and feed until pigs weigh 175-180 lbs.)

d. 13.5% protein mix

Ingredients	Pounds
Wheat	1,231.5
Milo	1,231.5
Soybean meal (44%)	394.5
Molasses	45.0
Di-calcium (hi-quality)	33.0
Limestone	31.0
Salt (trace minerals)	15.0
(Premix according to manufacturer's recommendation)	
Total	2,982.0

INFORMATION SHEET

(NOTE: This ration may be used to finish hogs from 180 lbs. to 220 lbs.)

(NOTE: The above rations on confinement feeding of swine were made available by Mr. Cleo Collins, District Supervisor, Vocational Agriculture.)

B. Beef

1. Growing ration for calves weighing

	350-450 lbs.	450-550 lbs.	550-650 lbs.
Ingredients	Pounds	Pounds	Pounds
Corn silage	1,450	1,515	1,555
Milo (steam flaked)	340	320	315
Dehydrated alfalfa	85	65	50
40% supplement	125	100	80
Total	2,000	2,000	2,000
Approximate daily consumption	24 lbs.	31 lbs.	38 lbs.

2. Fattening rations (high in milo)

Ingredients	Pounds	Pounds	Pounds
Corn silage	1,030	725	290
Dehydrated alfalfa	60	70	65
Rice hulls	65	75	110
Fat	-	20	40
Milo (steam flaked)	450	603	837
40% supplement	300	402	558
Total	95	105	100
	2,000	2,000	2,000
Concentrates	65%	75%	87%
Approximate daily consumption	32 lbs.	28 lbs.	30 lbs.
Days on each ration	10	10	Balance of feeding period

INFORMATION SHEET

3. Fattening ration (high in corn)

Ingredients	Pounds	Pounds	Pounds
Corn silage	1,030	725	290
Dehydrated alfalfa	60	70	65
Rice hulls	65	75	110
Fat	-	20	40
Corn (steam flaked)	450	603	837
Milo (steam flaked)	300	402	558
40% supplement	95	105	100
Total	2,000	2,000	2,000
Concentrates	65%	75%	87%
Approximate daily consumption	32 lbs.	28 lbs.	30 lbs
Days on each ration	10	10	Balance of feeding period

(NOTE: Beef feeding rations were made available to us by the Texas County Feed Yard, Guymon, Oklahoma.)

4. Show calf ration

Ingredients	Pounds
Oats or bran	1,000
Barley (crimped)	500
Maize (crimped)	500
Wheat or corn	500
Cottonseed meal	100
Soybean meal	50
Linseed meal	50
Molasses	150
Total	2,850

(Feed additives should be used according to manufacturer's recommendation)

(NOTE: This ration was made available by Mr. Benton Thomason, Young Farmer Coordinator, Northwest Area Vocational-Technical School, Alva.)

5. Conventional creep ration

Ingredients	Pounds
Corn (cracked or rolled)	1,200
Oats (whole)	600
Cottonseed meal	200
Total	2,000

INFORMATION SHEET

6. Creep ration using wheat

Ingredients	Pounds
Wheat (rolled)	900
Milo (rolled)	440
Oats (whole)	600
Cottonseed meal	60
Total	2,000

C. Dairy

1. Growing and fitting ration (18% protein)

Ingredients	Pounds
Milo (ground)	1,000
Oats (ground)	400
Wheat bran	200
Cottonseed meal	400
Total	2,000

Salt and a good mineral mixture
to be fed free choice
(1 to 1 calcium - phosphorous ratio)

(NOTE: Above ration was made available by Mr. Harold Williams, Vocational Agriculture instructor, Cushing, Oklahoma.)

2. Production ration

Ingredients	Pounds
Corn (ground)	1,400
Wheat bran	400
Soybean meal	200
Total	2,000

1% salt should be added
(Add minerals when needed)

D. Sheep

1. Creep ration

Ingredients	Pounds
Corn or sorghum	400
Barley	400
Molasses	200
Cottonseed meal (41%)	200
Legume hay	800
Total	2,000

INFORMATION SHEET

2. Show ration

Ingredients	Pounds
Corn (cracked)	1,000
Oats (rolled)	800
Wheat bran	200
Cottonseed meal	200
Total	2,000

3. Mature sheep ration

Ingredients	Pounds
Oats (rolled)	1,000
Barley (rolled)	800
Wheat bran	200
Total	2,000

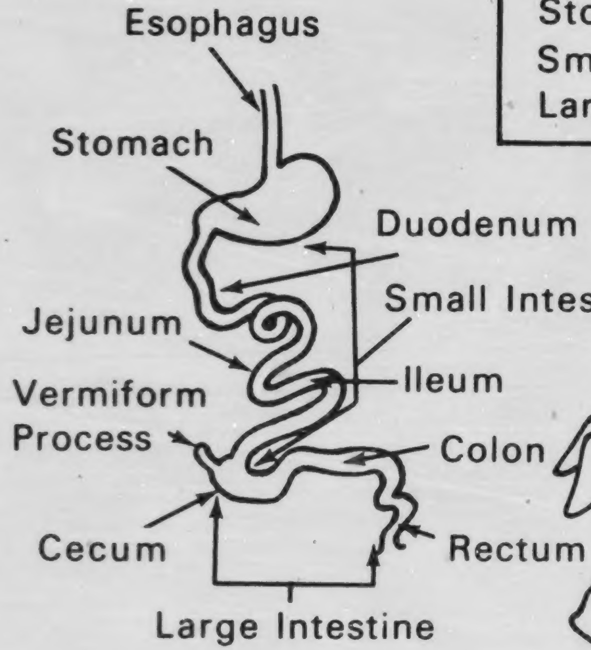
(NOTE: Add a good quality roughage to above grain rations. Salt and other minerals should be provided on a free choice basis.)

Composition of Farm Animals

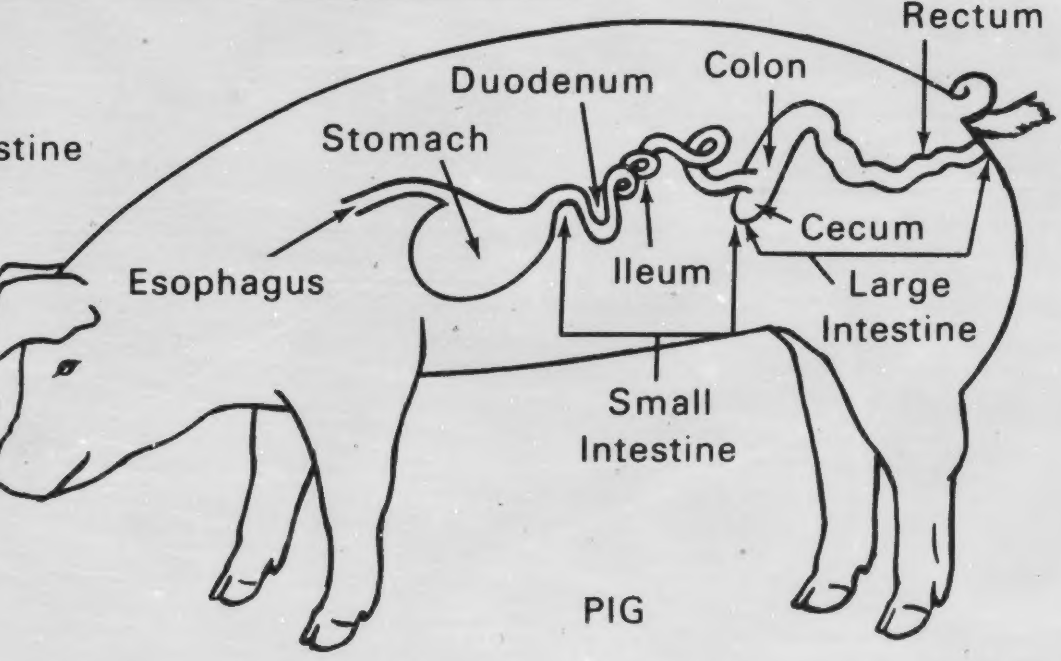
ANIMALS	WATER	PROTEIN	FAT	MINERAL MATTER
Slaughter Steer	50%	16%	30%	4%
Slaughter Sheep	61%	16%	20%	3%
Slaughter Hog	50%	14%	28%	8%
Dairy (aged cow)	59%	18%	18%	5%

Parts of A Simple Digestive System

APPROXIMATE CAPACITIES	MAN	PIG
Stomach	¼ ga.	2 gal.
Small Intestine	½ "	2 "
Large Intestine	½ "	2 "

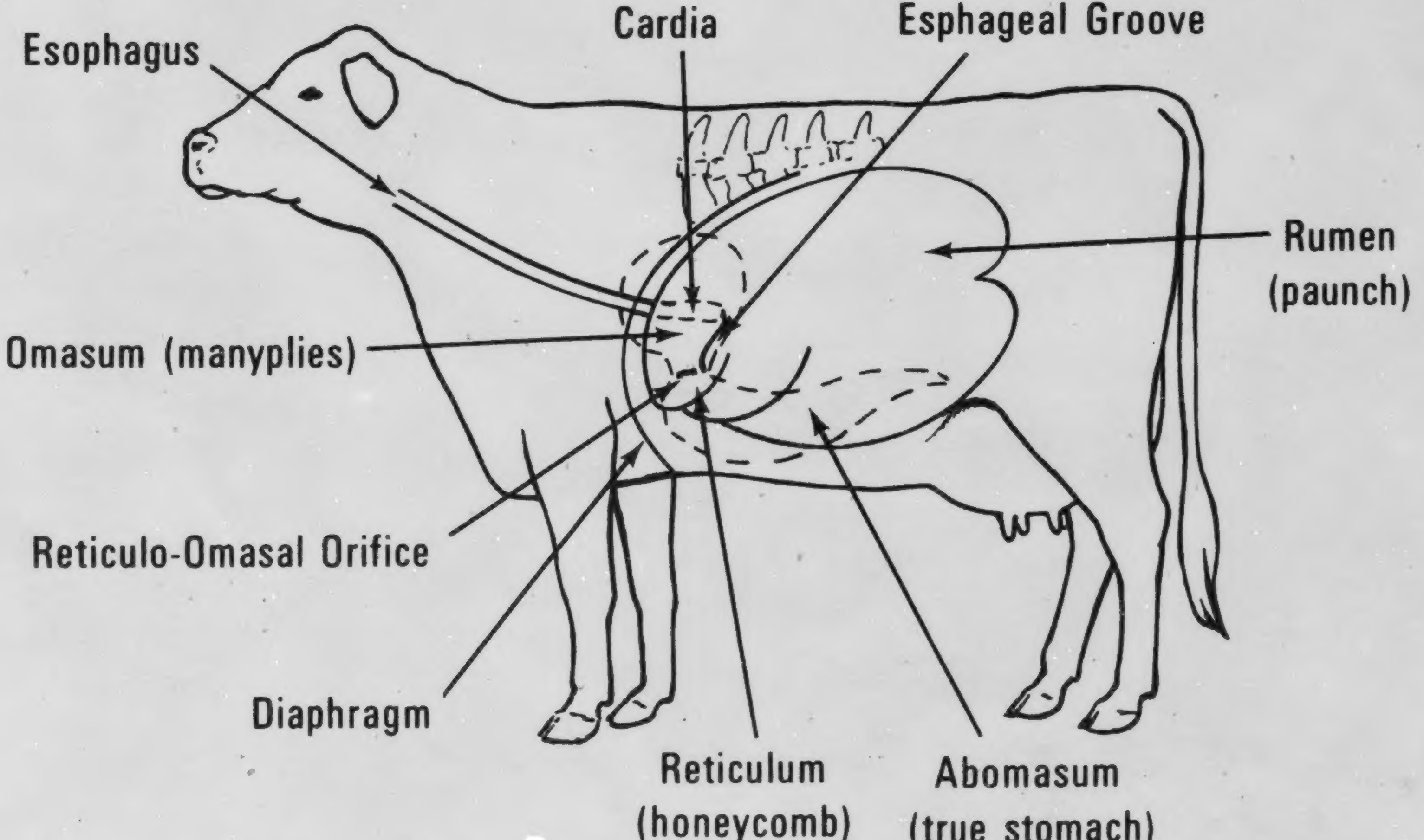

Esophagus
Stomach
Duodenum
Small Intestine
Jejunum
Ileum
Vermiform Process
Colon
Cecum
Rectum
Large Intestine

MAN


Rectum
Colon
Duodenum
Stomach
Esophagus
Ileum
Cecum
Large Intestine
Small Intestine

PIG

Parts of A Ruminant Digestive System


Esophagus
Cardia
Esphageal Groove
Rumen (paunch)
Omasum (manyplies)
Reticulo-Omasal Orifice
Diaphragm
Reticulum (honeycomb)
Abomasum (true stomach)

LIVESTOCK FEEDING
UNIT IV

ASSIGNMENT SHEET #1--BALANCE RATIONS USING THE PEARSON SQUARE METHOD

Ration #1 16% ration using corn, 6.6% digestible protein and soybean meal, 41% digestible protein. Give pounds of each for a ton of ration.

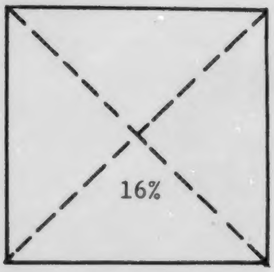
Ration #2 14% ration using barley, 11% digestible protein and a prepared supplement, 36% digestible protein. Mix one ton of ration.

Ration #3 16% ration using equal parts of corn 6.6% and milo 8.8%, and equal parts of soybean meal 44% and meat and bone scraps 55%. Mix a ton of ration.

LIVESTOCK FEEDING
UNIT IV

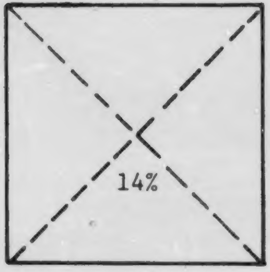
ANSWERS TO ASSIGNMENT SHEET #1

1.



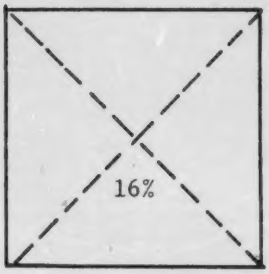
	Parts	Percentage	#/Ton
corn 6.6%	25	73%	1460# corn
SBM 41%	9.4	27%	540# SBM
Total	34.4	100%	2000# ration

2.



	Parts	Percentage	#/ton
barley 11%	22	88%	1760# barley
supplement 36%	3	12%	240# supplement
Total	25	100%	2000# ration

3.



	Parts	Parts	Percentage	#/Ton
7.7% milo 8.8%	33.5	16.75 milo	40%	800# milo
corn 6.6%		16.75 corn	40%	800# corn
SBM 44%		4.15 SBM	10%	200# SBM
M&BS 55% 49.5%	8.3	4.15 M&BS	10%	200# B&BS
Total	41.8	41.8	100%	2000# ration

LIVESTOCK FEEDING
UNIT IV

TEST

1. Match terms on the right with their correct definition.

_____a. Ration which supplies all the necessary nutrients in proper proportions for a period of 24 hours

_____b. Feed high in fiber and low in total digestible nutrients

_____c. Healthy appearance indicating that the animal is doing well on feed

_____d. Tough part of feed which is not very digestible

_____e. Feed necessary for a given animal for 24 hours

_____f. Feed high in total digestible nutrients and low in fiber

_____g. Passing of food materials from digestive tract into the body after they are digested and dissolved

_____h. Proportion of a feed which is usable to supply energy to the animal

_____i. Chewing of food by an animal

_____j. Amount of crude protein in a feed that can be digested by the animal

_____k. Building blocks of protein

_____l. Process which breaks down food before absorption into the body

_____m. Nitrogen containing compounds in feed

1. Ration
2. Balanced ration
3. Nutrient
4. Digestible
5. Digestion
6. Mastication
7. Concentrate
8. Roughage
9. Ruminant
10. Simple stomach animal
11. Crude protein
12. Digestible protein
13. Absorption
14. Bloom
15. Feces
16. Protein
17. Palatable feed
18. Amino acids
19. Total digestible nutrients
20. Fiber

_____n. A feed that is tasty to animals

_____o. That portion of a nutrient which may be digested and absorbed by the animal

_____p. One that has only one stomach

_____q. Nutrient which supplies materials for body growth

_____r. Single class of food that aids in support of life

_____s. Animal that has more than one compartment in his stomach

_____t. Waste material of animals (manure)

2. Fill in the blanks in table with the approximate percentages.

COMPOSITION OF FARM ANIMALS

Animal	Water	Fat	Protein	Mineral Matter
Slaughter steer	a.________	d.________	30%	j.________
Slaughter sheep	61%	e.________	g.________	3%
Slaughter hog	b.________	14%	h.________	k.________
Dairy cow (aged)	c.________	f.________	i.________	l.________

3. Match the parts of a simple digestive system on the right with the correct function.

_____a. Passageway to stomach

_____b. Chewing and secretion of saliva

_____c. Enzymes and pancreatic juices added

_____d. Water absorbed

_____e. Passageway to expel waste

_____f. Hydrochloric acid added and absorption begins

1. Mouth
2. Esophagus
3. Anus
4. Stomach
5. Small intestine
6. Large intestine

4. List four main parts of the ruminant stomach.

a.

b.

c.

d.

5. List six classes of nutrients.

a.

b.

c.

d.

e.

f.

6. List four functions of water in the animal body

a.

b.

c.

d.

7. Name five purposes of a ration.

   a.

   b.

   c.

   d.

   e.

8. Select from a list the characteristics of a good ration by placing an "X" in front of the correct statements.

   _____a. Hard to get

   _____b. Economical

   _____c. Palatable

   _____d. Contains only roughages

   _____e. Causes no harmful effects

   _____f. Bagged in 50# bags

9. List the characteristics of the following grains used as feedstuffs.

   a. Corn

      1)

      2)

      3)

      4)

   b. Wheat

      1)

      2)

   c. Milo and grain sorghums

      1)

      2)

10. List the composition of a good ration.

    a.

    b.

    c.

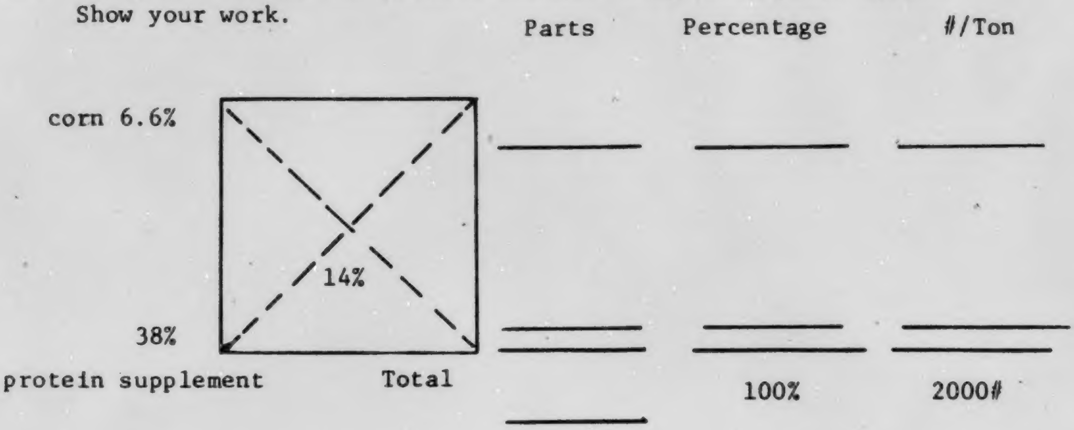
    d.

11. Name two thumb rules for feeding swine.

    a.

    b.

12. Balance a ration for protein content using the square method. Show your work.


Parts
Percentage
#/Ton
corn 6.6%
14%
38%
protein supplement
Total
100%
2000#

LIVESTOCK FEEDING
UNIT IV

ANSWERS TO TEST

1. a. 2

   b. 8

   c. 14

   d. 20

   e. 1

   f. 7

   g. 13

   h. 19

   i. 6

   j. 12

   k. 18

   l. 5

   m. 11

   n. 17

   o. 4

   p. 10

   q. 16

   r. 3

   s. 9

   t. 15

2. a. 50%

   b. 50%

   c. 59%

   d. 16%

   e. 16%

   f. 18%

   g. 20%

   h. 28%

   i. 18%

   j. 4%

   k. 8%

   l. 5%

3. a. 2

   b. 1

   c. 5

   d. 6

   e. 3

   f. 4

4. a. Rumen

   b. Reticulum

   - c. Omasum
   - d. Abomasum

5. a. Water
   - b. Proteins
   - c. Vitamins
   - d. Fats
   - e. Minerals
   - f. Carbohydrates

6. Any four of the following
   - a. Important element in the blood
   - b. Dissolves feed
   - c. Regulates body temperature
   - d. Removes body waste
   - e. Transports feed

7. a. Maintenance
   - b. Growth
   - c. Finishing
   - d. Production
   - e. Reproduction

8. b,c,e

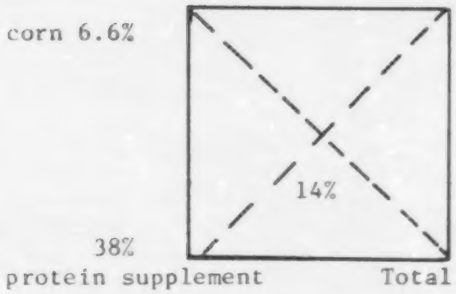
9. a. Corn
      1. 80% TDN
      2. High in fat
      3. Yellow or white in color
      4. Deficient in protein and mineral
   - b. Wheat
      1. High in TDN
      2. High in protein

   c. Milo and grain sorghums
      1. 70% TDN
      2. Low quality protein

10. a. Concentrate and roughage
    b. Protein of sufficient amount and quality
    c. Minerals in proper amounts
    d. Vitamins in proper amounts

11. Any two of the following
    a. Nursing sows--Three pounds of grain per 100 pounds of live weight per day
    b. Fattening--Four pounds of grain and supplement per 100 pounds of live weight per day
    c. 350 pounds of grain and supplement to produce 100 pounds of live weight

12.



	Parts	Percentage	#/Ton
corn 6.6%	24	76%	1520#
38% protein supplement	7.4	24%	480#
Total	31.4	100%	2000#

PLANT AND SOIL SCIENCE
UNIT I

TERMINAL OBJECTIVES

After completion of Unit I, the student should be able to discuss the importance of crop production and identify the various plants common to Kansas. He should also be able to classify plants and discuss factors affecting crop production. He should be able to identify occupations in the plant and soil science area. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with plant and soil science to the correct definitions.
2. List three reasons crop production is important.
3. List five major crops grown in Kansas.
4. List five major crops grown in the U. S.
5. Classify plants by matching them with the correct class.
6. Match the percentage of land use in the U. S. and Kansas with its correct use.
7. List three general factors affecting the crop to be grown in a particular area.
8. Match occupations in the plant and soil science area with the appropriate description.
9. Identify the parts of the grass plant.
10. Collect and identify ten pasture and range plants and five weeds common to the community.

PLANT AND SOIL SCIENCE
UNIT I

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information and assignment sheets
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information sheet
6. Collect pasture and range plants and weeds to be used in identification
7. Show slides of plants and weeds
8. Give test

Student:

1. Read objective sheet
2. Study information sheet
3. Collect samples of pasture and range plants and weeds common to your area
4. Identify pasture and range plants and weeds provided by the teacher
5. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objective sheet
2. Information sheet
3. Transparency masters
    - TM 1--Economic Values of Crops in the State and Nation
    - TM 2--Major Use of Land
    - TM 3--Major Crop Areas - United States
    - TM 4--Cropland Acreage in Kansas by County
    - TM 5--Principle Parts of a Grass Plant
4. Assignment Sheet #1--Collect and Identify Common Weeds and Pasture and Range Plants
5. Test
6. Answers to test

References:

1. Hughes, Harold D. and Edwin R. Hensen. Crop Production. New York: The Macmillian Co., 1967.

2. Instructional Materials for Vocational Agriculture I. College Station, Texas: Teaching Materials Center, Agricultural Education Department, Texas A & M Universtiy.

3. Some Identifying Characteristics of 52 Ohio Seed. Columbus, Ohio: Department of Agricultural Education, The Ohio State University.

4. Dictionary of Occupational Titles. Washington, D.C. United States Government Printing Office.

5. Kansas Agriculture - 58th Annual Report, Kansas State Board of Agriculture, State Printer, Topeka, Kansas 66612.

6. 1974 Census of Agriculture, United States Department of Agriculture, Washington D.C. (May be obtained from your Congressman)

7. Agricultural Statistics 1975, United States Department of Agriculture, U.S. Govertment Printing Office, Washington, D.C.

PLANT AND SOIL SCIENCE
UNIT I

INFORMATION SHEET

I. Terms and definitions

A. Agronomy--Science of crop production and soil management

B. Annual--Plant which completes its life cycle in one year

C. Perennial--Plant which lives more than one year, but in some cases, produces seed the first year

D. Arable land--Land which is capable in its present condition of producing crops requiring tillage

E. Arid climate--Climate in which the annual rainfall is less than ten inches

F. Cereal--Grass grown to be used for feed and seed

G. Fertility--Amount of nutrients in the soil to support plant growth

H. Forage--Livestock feeds, such as pasture, hay, or silage

I. Legume--Soil improving plant which manufactures nitrogen

J. Range--Extensive area of natural pasture land

K. Weed--Undesirable plant growing with a crop-a plant out of place

L. Cool season plant--One which grows during the fall, winter, or spring

M. Warm season plant--One which grows during the summer and early fall

N. Native--Plant originating in North America that is native to a particular region.

O. Introduced--Plant brought in from countries outside the United States

P. Climax--Top ranking native plants in the area

Q. Decreaser--Plant that decreases on a range when exposed to heavy grazing pressures

R. Increaser--Plant that increases on a range when decreasers are reduced

S. Invader--Plant which comes into a range after both increasers and decreasers have been reduced

INFORMATION SHEET

T. Grazing value--Worth of a plant for livestock production

Examples:

1. Good--Plants with top qualtiy grazing value
2. Fair--Plants with medium quality grazing value
3. Poor--Plants with low quality grazing value

U. Awn--Pointed bristle-like appendage

V. Hull--Outside covering of a seed

W. Rachilla--Small stalk attached at the bottom of certain grass seeds

X. Spikelet--Seed containing unit of the grass plant

(NOTE: A spikelet may contain several seeds or a single seed.)

II. Importance of crop production

A. Furnishes food

B. Protects the soil

C. Beautifies the environment

D. Provides jobs

INFORMATION SHEET

III. Major crops grown in Kansas (Transparency 1)

	Acres Harvested 1974
A. Winter wheat	11,600,000
B. All hay	2,320,000
1. Wild hay (prairie, marsh, or salt grass)	830,000
2. Alfalfa hay	1,070,000
3. Tame hay other than alfalfa	420,000
C. Barley	50,000
D. Grain sorghum for all purposes	3,975,000
1. For grain	3,320,000
2. For forage & silage	655,000
E. Oats	240,000
F. Soybeans	1,030,000
G. Rye	20,000
H. Corn for all purposes	2,200,000
1. For grain	1,730,000
2. For forage & silage	470,000
I. Popcorn	12,200
J. Sugar beets	35,100
K. Dry beans	10,000

IV. Major crops grown in U.S.

A. Corn

B. Wheat (winter & spring)

C. Oats

D. Barley

E. Rye

- F. Grain sorghum
- G. Cotton
- H. Tobacco
- I. Rice
- J. Sugar crops
- K. Alfalfa
- L. Soybeans
- M. Peanuts

V. Classes of plants

- A. Cereals
    - 1. Rice
    - 2. Wheat
    - 3. Corn
    - 4. Oats
- B. Root crops
    - 1. Potatoes
    - 2. Sweet potatoes
- C. Tree crops
    - 1. Pecans
    - 2. Apples
    - 3. Peaches
- D. Oil seed crops

    (NOTE: These may be used for seed or oil.)

    - 1. Soybean
    - 2. Peanut
    - 3. Cotton seed

INFORMATION SHEET

E. Pulses--Leguminous plant or their seeds

(NOTE: This includes chiefly those plants with large seed used for food.)

1. Beans
2. Peas

VI. Land use

A. In the United States (Transparencies 2 and 3)

1. Total acres - 2,271, million acres	percent
2. Cities, roads, railroads, parks, etc.	6.3%
3. Desert, swamp, rock, etc.	12.9%
4. Cropland	20.2%
5. Grassland, pasture and grazing land	27.8%
6. Forest land	32.8%

B. In Kansas (Transparency 4)

1. Total land area	52,545,000 Acres
2. Land in farms	47,553,071 Acres
3. Percent of land area in farms	90.5%
4. Number of farms	81,909
5. Average size of farms	581 Acres
6. Total cropland	29,730,539 Acres
7. Total woodland	785,242 Acres

(NOTE: Compare county statistics with state statistics.)

VII. Factors affecting crop production

A. Soil fertiltiy

B. Climatic conditions

C. Economic factors

D. Type of land

INFORMATION SHEET

VIII. Occupations in plant and soil science

- A. Farmer--Raises crops to sell
- B. Farm laborer--Works for farmer
- C. Farm manager--Manages farms for owners
- D. Grain elevator employee--Loads, unloads, weighs, and handles grain at an elevator
- E. Soil conservation worker--Works with and assists farmers with problems on soil conservation
- F. Seed dealers--Sells seed
- G. College teacher and researcher--Teaches students and researches agronomy, plant science, soil science, and other courses

(NOTE: For other occupations in the field of plant and soil science, check The Dictionary of Occupational Titles, available from U.S. Government Printing Office. Also, check with school counselor.)

IX. Parts of a grass plant (Transparency 5)

- A. Inflorescence
- B. Florlets
- C. Culm
- D. Second glume
- E. Awn
- F. Node
- G. First glume
- H. Internode
- I. Sheath
- J. Blade
- K. Ligule
- L. Collar
- M. Shoot

INFORMATION SHEET

N. Auricle

O. Crown

P. Stolon

Q. Rhizome or underground stem

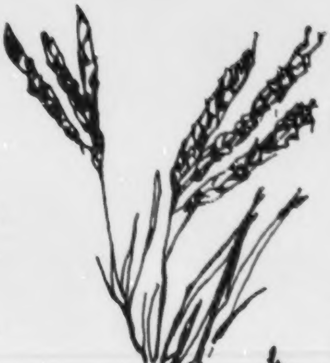
R. Fibrous roots

X. Common pasture and range plants

A. Big bluestem--Perennial, warm season, native, decreaser, good grazer

1. Plant--Tall grass, short roots, stemmy, hair at base

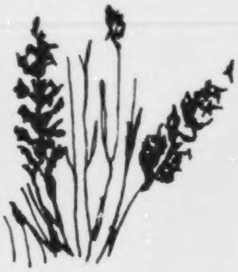
2. Seed--Long, very small, head branches into three parts resembling a turkey's foot



B. **Indiangrass**--Perennial, warm season, native, decreaser, good grazer

1. Plant--Tall grass, ligule at base of leaf attached to stem

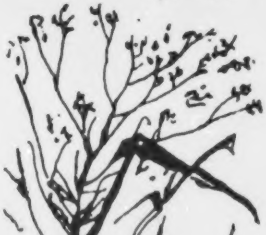
2. Seed--Produced in heads like sorghum, golden in color



C. Switchgrass--Perennial, warm season, native, decreaser, good grazer

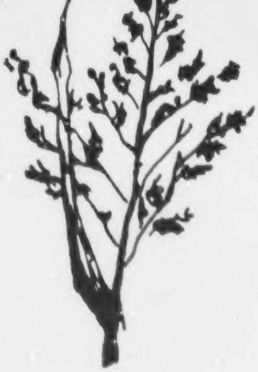
1. Plant--Tall grass, large seed head, white hair present at base of leaf

2. Seed--Large, sprangled-type head



D. Johnsongrass--Perennial, warm season, introduced

1. Plant--Tall grass, wide leaves, thick light-colored mid-vein



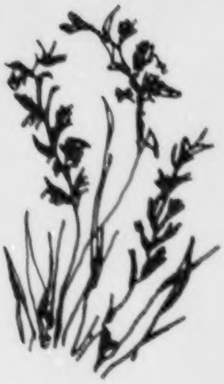
INFORMATION SHEET

2. Seed--Glossy and black to ivory in color

E. Little bluestem--Perennial, warm season, native, decreaser, good grazer

1. Plant--Deep roots, bluish stem, leaves tend to fold

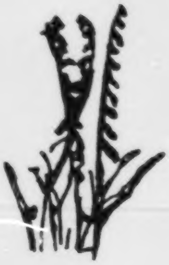
2. Seed--White in color, very small, soft



F. Sideoat grama--Perennial, warm season, native, increaser

1. Plant--Oatlike seeds produced on one side of plant

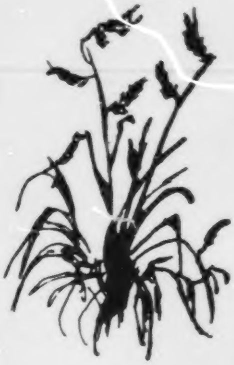
2. Seed--Small, produced in large quantities



G. Hairy grama--Perennial, warm season, native, increaser

1. Plant--Short grass, comblike seed head

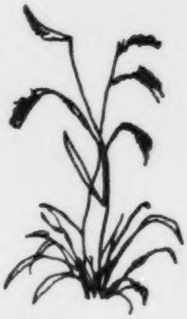
2. Seed--Covered with hair, curved needle-like points



H. Blue grama--Perennial, warm season, native, increaser

1. Plant--10-20 inches high, bunch grass, reproduces by seed

2. Seed--Curved, resembling human eyebrow

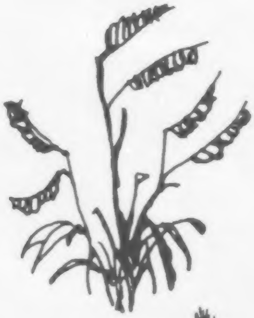


INFORMATION SHEET

I. Buffalograss--Perennial, warm season, native, increaser

   L. Plant--Short grass, leaves close to ground

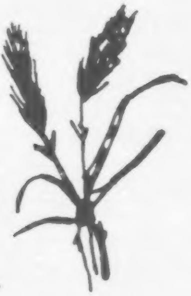
   2. Seed-Produced in burs, each bur contains 1-4 seeds



J. Canada wildrye--Perennial, cool season, native, increaser

   1. Plant-Tall grass, spear-like blades

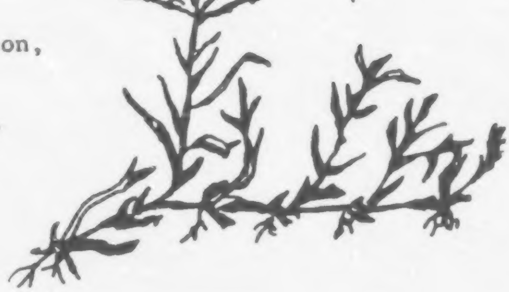
   2. Seed--Long awn, curve downward after maturing



K. Bermudagrass--Perennial, warm season, introduced, good grazer

   1. Plant--Sod forming, spreads by runners

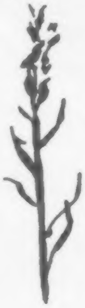
   2. Seed--Produced in slender spike-flowering heads



L. Cheat--Annual, cool season, introduced

   1. Plant--Grassy plant, 5-15 florets per spikelet

   2. Seed--Straw-colored, canoe-shaped, rachilla joint

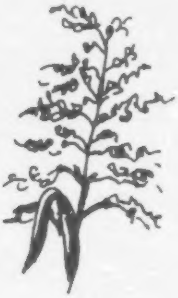


INFORMATION SHEET

M. Sudangrass--Annual, warm season, introduced

   1. Plant--Tall grass, long seed head

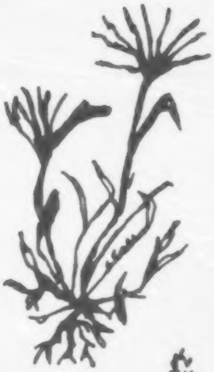
   2. Seed--Round, yellow, pink or red, short rachilla



N. Crabgrass--Annual, warm season, introduced, invader

   1. Plant--Leaf blades somewhat hairy, seeds borne in 3-10 segments

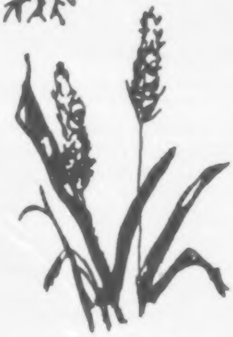
   2. Seed--Straw color to green or purple, 3 ribbed, pointed one end, somewhat hairy



O. Foxtail--Annual, warm season, introduced

   1. Plant--Golden pump-like seed head, claw-like ligule where leaf attaches to stem

   2. Seed--Yellow to brown, large



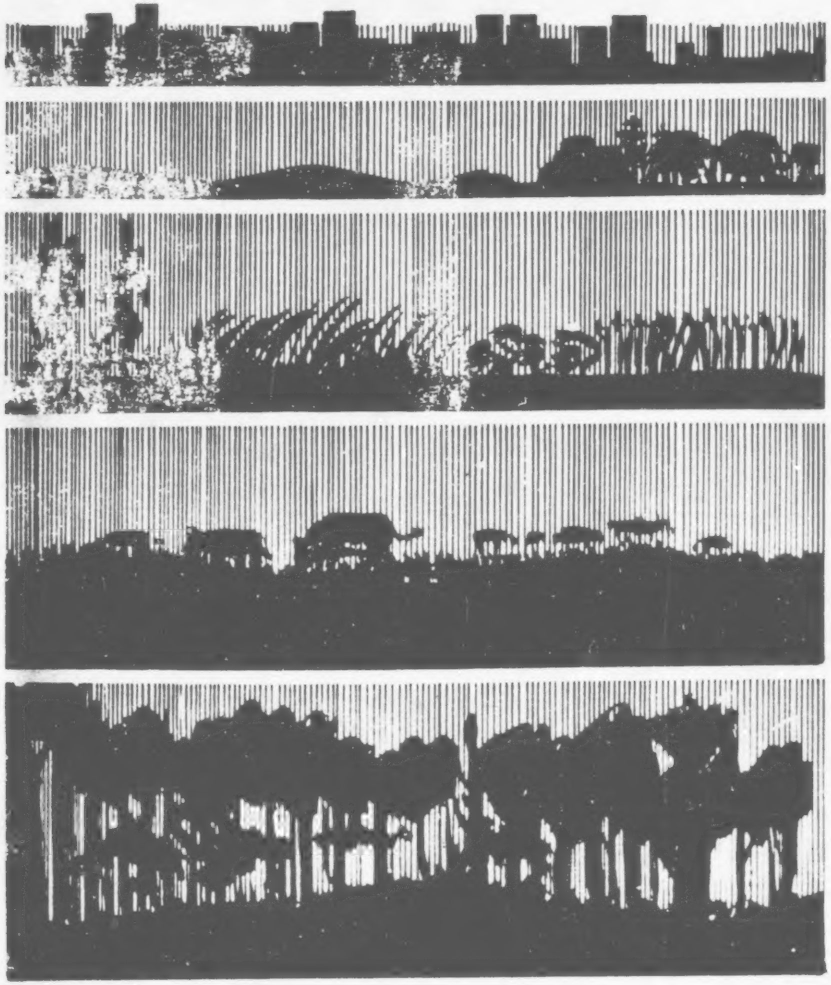
P. Additional plants to be added by local instructor

ECONOMIC VALUES OF CROPS IN THE STATE AND NATION

	Farm Value in Thousands of Dollars			Thousand Acres Harvested		
CROP	NATION '74	STATE '74	COUNTY	NATION'74	STATE'74	COUNTY
Wheat	7,241,641	1,291,950		65,459	11,600	
Grain Sorghum (for grain)	1,751,432	409,024		13,917	3,320	
Oats	927,555	12,276		13,325	240	
Barley	821,832	3,100		8,281	50	
Corn	13,716,772	531,780		65,194	2,200	
Sugar Beets	1,307,132	35,807		1,216	35	
Soybeans	8,245,590	157,590		52,460	1,030	
Hay (all)	5,769,594	202,992		60,546	2,320	

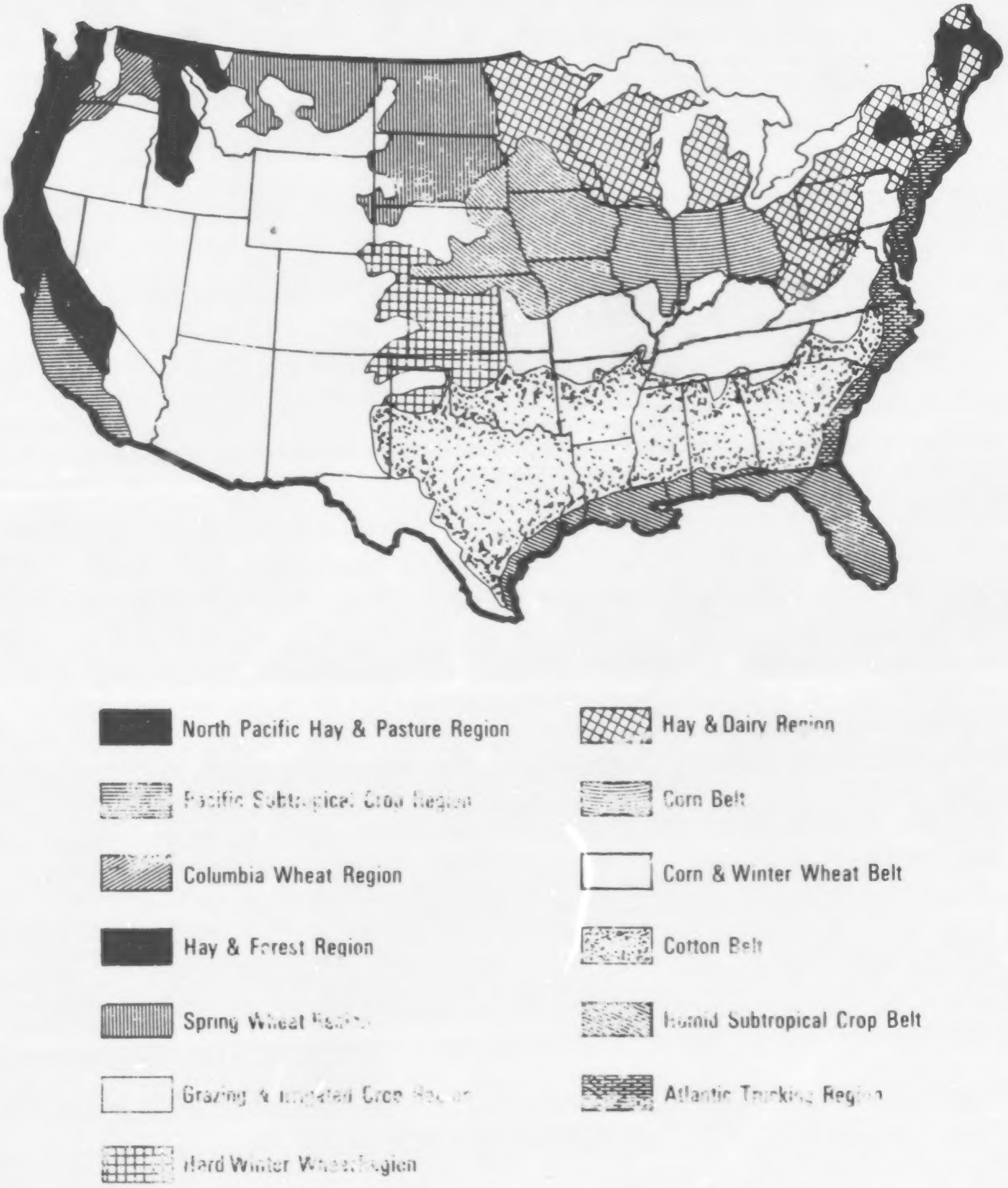
Major Use of Land

TOTAL U.S. ACREAGE - 2,271 MILLION ACRES

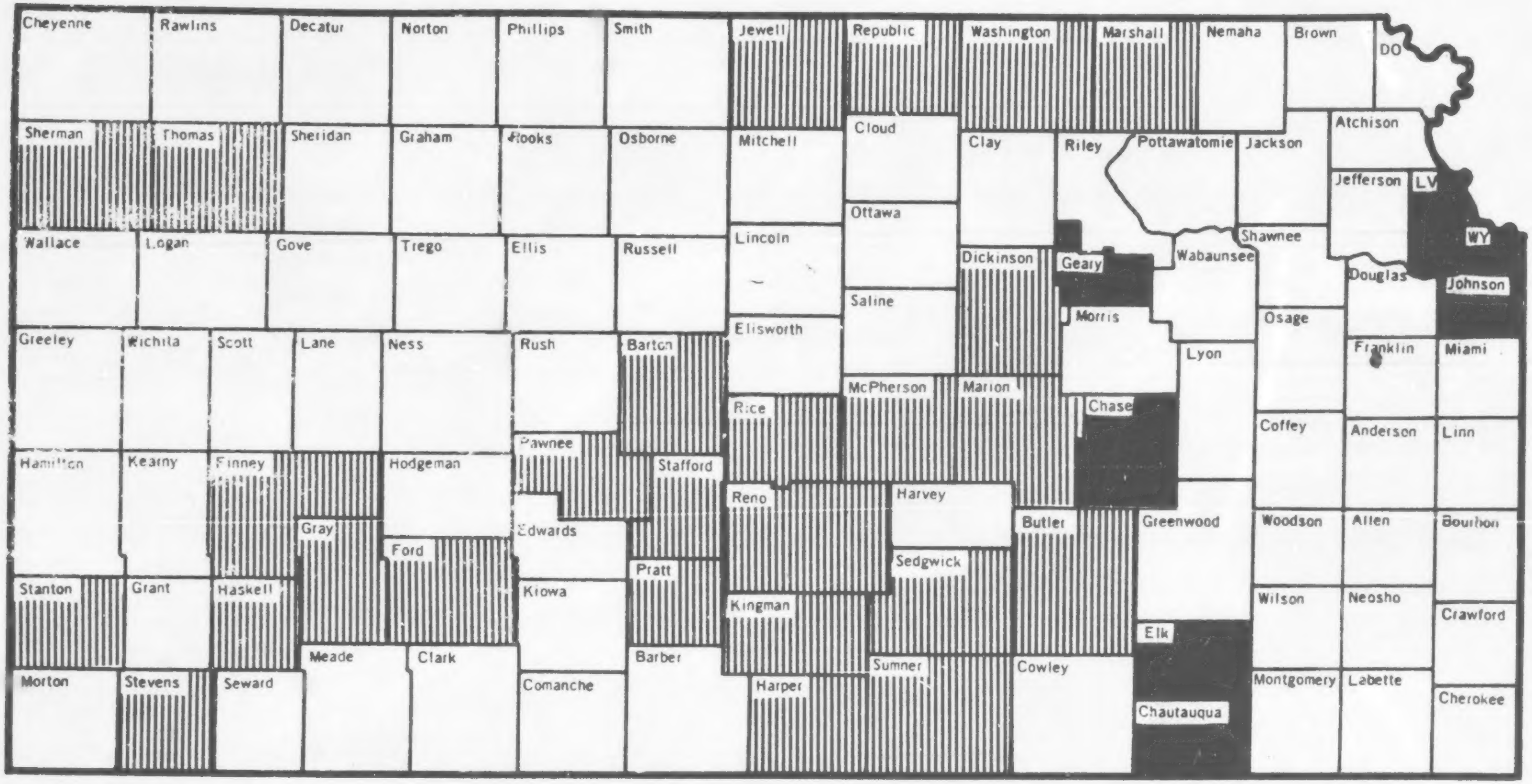


PERCENT	TYPE OF LAND
6.3 %	Cities, roads, railroads, parks, etc.
12.9 %	Desert, swamp, rock, etc.
20.2%	Cropland
27.8 %	Grassland, pasture and grazing land
32.8 %	Forest land

Major Crop Areas- United States


North Pacific Hay & Pasture Region
Pacific Subtropical Crop Region
Columbia Wheat Region
Hay & Forest Region
Spring Wheat Region
Grazing & Irrigated Crop Region
Hard Winter Wheat Region
Hay & Dairy Region
Corn Belt
Corn & Winter Wheat Belt
Cotton Belt
Humid Subtropical Crop Belt
Atlantic Trucking Region

HARVESTED CROPLAND ACREAGE IN KANSAS BY COUNTY


Cheyenne
Rawlins
Decatur
Norton
Phillips
Smith
Jewell
Republic
Washington
Marshall
Nemaha
Brown
DO
Sherman
Thomas
Sheridan
Graham
Rooks
Osborne
Mitchell
Cloud
Clay
Riley
Pottawatomie
Jackson
Atchison
Jefferson
LV
Wallace
Logan
Gove
Trego
Ellis
Russell
Lincoln
Ottawa
Dickinson
Geary
Wabaunsee
Shawnee
WY
Douglas
Johnson
Saline
Morris
Greeley
Wichita
Scott
Lane
Ness
Rush
Barton
Ellsworth
Lyon
Osage
Franklin
Miami
McPherson
Marion
Rice
Chase
Coffey
Anderson
Linn
Pawnee
Hamilton
Kearny
Finney
Hodgeman
Stafford
Reno
Harvey
Edwards
Gray
Ford
Butler
Greenwood
Woodson
Allen
Bourbon
Pratt
Sedgwick
Stanton
Grant
Haskell
Kiowa
Kingman
Wilson
Neosho
Crawford
Elk
Meade
Clark
Barber
Sumner
Cowley
Morton
Stevens
Seward
Comanche
Harper
Chautauqua
Montgomery
Labette
Cherokee

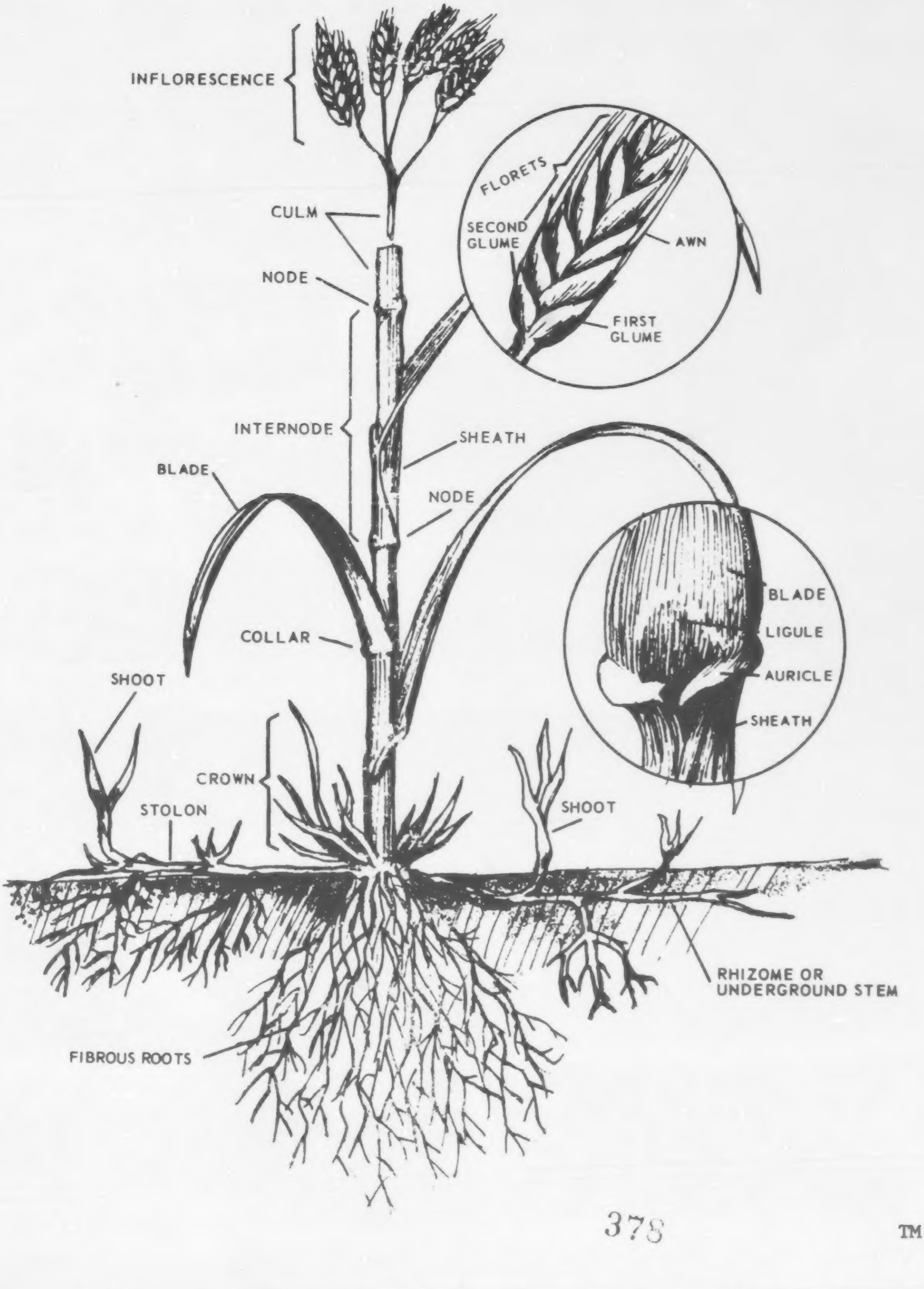
LEGEND

■ 100,000 acres or less

□ 100,000 - 250,000 acres

▥ over 250,000 acres

Principle Parts of a Grass Plant


INFLORESCENCE
CULM
NODE
FLORETS
SECOND GLUME
AWN
FIRST GLUME
INTERNODE
SHEATH
BLADE
NODE
BLADE
LIGULE
AURICLE
SHEATH
COLLAR
SHOOT
CROWN
STOLON
SHOOT
RHIZOME OR UNDERGROUND STEM
FIBROUS ROOTS

PLANT AND SOIL SCIENCE
UNIT I

ASSIGNMENT SHEET #1--COLLECT AND IDENTIFY WEEDS AND PASTURE AND RANGE PLANTS

Each student should collect and identify five weeds and ten pasture and range plants common to his community. Assign each specimen collected a number and list the name of the plant by that number. When complete turn in to instructor for evaluation.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

PLANT AND SOIL SCIENCE
UNIT I

TEST

1. Match the terms on the right to the correct definition.

_____a. Plant which completes its life cycle in one year

_____b. Grass grown to be used for feed and seed

_____c. Extensive area of natural pasture land

_____d. One which grows during the summer and early fall

_____e. Plant that decreases on a range when exposed to heavy grazing pressures

_____f. Pointed bristle-like appendage

_____g. Science of crop production and soil management

_____h. Climate in which the annual rainfall is less than ten inches

_____i. Livestock feeds, such as pasture, hay, or silage

_____j. Top ranking native plants in the area

_____k. Plant that increases on a range when decreasers are reduced

_____l. Outside covering of a seed

_____m. Soil improving plant which manufactures nitrogen

1. Agronomy
2. Annual
3. Perennial
4. Arable land
5. Arid climate
6. Cereal
7. Fertility
8. Forage
9. Legume
10. Range
11. Weed
12. Cool season plant
13. Warm season plant
14. Native
15. Introduced
16. Climax
17. Decreaser
18. Increaser
19. Invader
20. Grazing value
21. Awn
22. Hull

_____n. Plant which lives more than one year, but in some cases, produces seed the first year

_____o. Land which is capable in its present condition of producing crops requiring tillage

_____p. Undesirable plant growing with a crop

_____q. One which grows during the fall, winter, or spring

_____r. Plant originating in North America

_____s. Seed containing unit of grass plant

_____t. Small stalk attached at the bottom of certain grass seeds

_____u. Worth of a plant for livestock production

_____v. Plant which comes into a range after both increasers and decreasers have been reduced

_____w. Plant brought in from countries outside the U.S.

_____x. Amount of nutrients in the soil to support plant growth

23. Rachilla

24. Spikelet

2. List three reasons crop production is important.

   a.

   b.

   c.

3. List five major crops grown in Kansas.

   a.

   b.

   c.

   d.

   e.

4. List five major crops grown in the United States.

   a.

   b.

   c.

   d.

   e.

5. Classify the following plants by matching them with the correct plant class. (Classes may be used more than once.)

_____a. Potatoes

_____b. Rice

_____c. Wheat

_____d. Pecans

_____e. Beans

_____f. Soybeans

_____g. Apples

_____h. Corn

Plant Classes

1. Cereals
2. Root crop
3. Oil seed
4. Pulses
5. Tree crop

6. Match the percentage of land use in the United States and Kansas with its correct land use.

a. U.S.

_____1) Cropland   a) 6.3%

_____2) Forest land   b) 12.9%

_____3) Cities, roads, railroads, etc.   c) 20.2%

_____4) Desert, swamp, rock, etc.   d) 27.8%

_____5) Grassland, pasture and grazing land   e) 32.8%

b. Kansas

_____1) Total land area   a) 90.5%

_____2) Land in farms   b) 581 Acres

_____3) Percent of land area in farms   c) 785,242 Acres

_____4) Number of farms   d) 52,545,000 Acres

_____5) Average size of farms   e) 81,909 Farms

_____6) Total cropland   f) 29,730,539 Acres

_____7) Total woodland   g) 47,553,071 Acres

7. List three general factors affecting the crop to be grown in a particular area.

a.

b.

c.

8. Match plant and soil science occupations on the right with the appropriate description on the left.

_____a. Works with and assists farmers   1. Farm laborer

_____b. Teaches students   2. Soil conservation worker

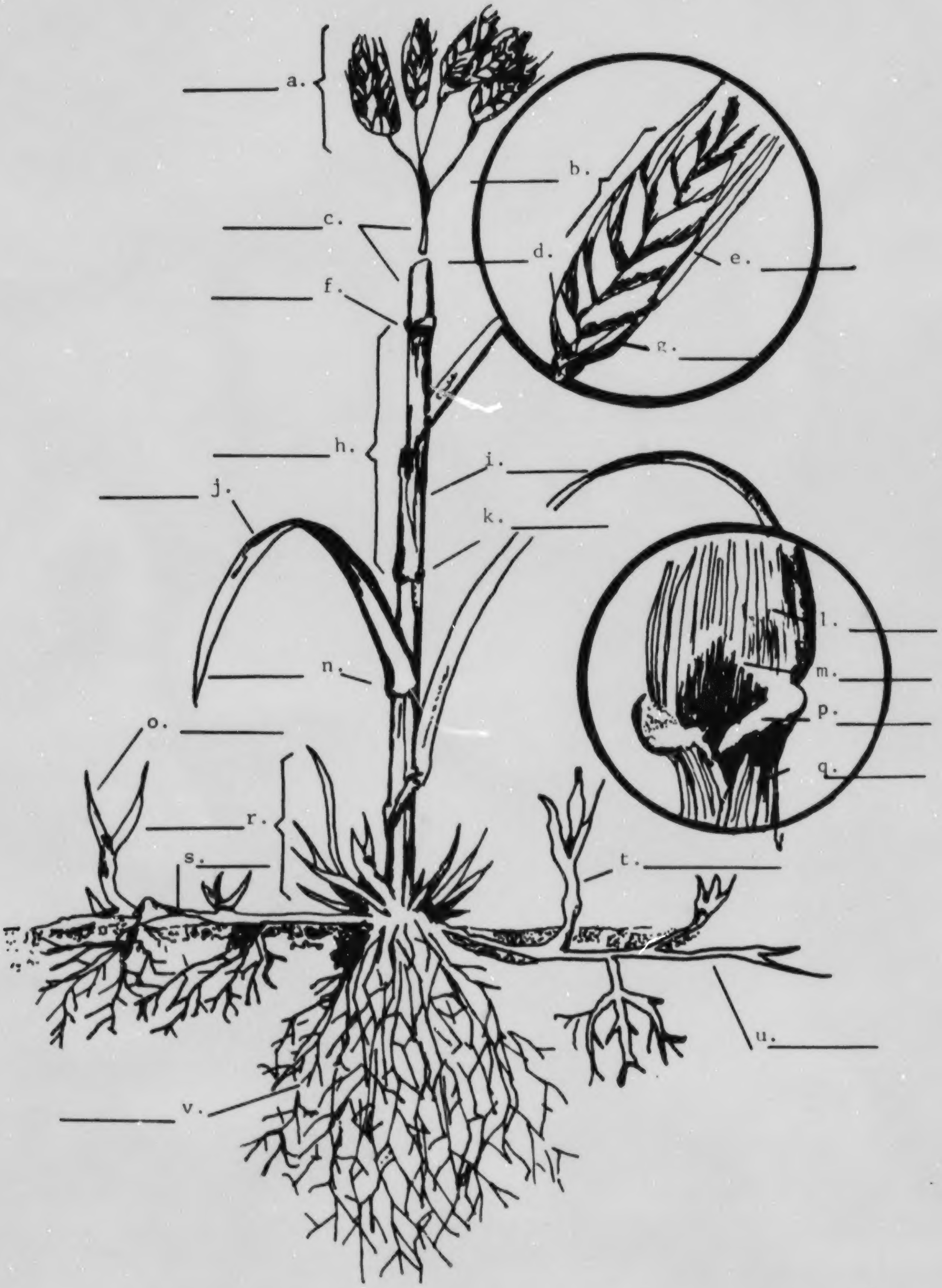
_____c. Handles grain   3. Grain elevator employee

_____d. Raises crops   4. Farmer

_____e. Works for farmers   5. College teacher

_____f. Manages a farm   6. Farm manager

9. Label the parts of this grass plant.


a.
b.
c.
d.
e.
f.
g.
h.
i.
j.
k.
l.
m.
n.
o.
p.
q.
r.
s.
t.
u.
v.

10. Collect and identify five weeds and ten pasture and range plants common to the community.

    (NOTE: If this has not been accomplished prior to the test, ask the instructor when the above activity should be completed.)

PLANT AND SOIL SCIENCE
UNIT I

ANSWERS TO TEST

1. a. 2
   b. 6
   c. 10
   d. 13
   e. 17
   f. 21
   g. 1
   h. 5
   i. 8
   j. 16
   k. 18
   l. 22
   m. 9
   n. 3
   o. 4
   p. 11
   q. 12
   r. 14
   s. 24
   t. 23
   u. 20
   v. 19
   w. 15
   x. 7

2. Any three of the following
   a. Furnishes food
   b. Protects the soil
   c. Beautifies the environment
   d. Provides jobs

3. Any five of the following
   a. Winter wheat
   b. Hay
   c. Barley
   d. Grain sorghum
   e. Sugarbeets
   f. Oats
   g. Soybeans
   h. Drybeans
   i. Rye
   j. Corn
   k. Popcorn

4. Any five of the following
   a. Corn
   b. Wheat
   c. Oats
   d. Barley
   e. Rye
   f. Grain sorghum
   g. Cotton
   h. Tobacco
   i. Rice
   j. Sugar crops
   k. Alfalfa
   l. Soybeans
   m. Peanuts

5. a. 2
   b. 1
   c. 1
   d. 5
   e. 4
   f. 3
   g. 5
   h. 1

6. a. 1) c
      2) e
      3) a
      4) b
      5) d
   b. 1) d
      2) g
      3) a
      4) e
      5) b
      6) f
      7) c

7. Any three of the following
   a. Soil fertility
   b. Climatic conditions
   c. Economic factors
   d. Type of land

8. a. 2
   b. 5
   c. 3
   d. 4
   e. 1
   f. 6

9. a. Inflorescence
   b. Florets
   c. Culm
   d. Second glume
   e. Awn
   f. Node
   g. First glume
   h. Internode
   i. Sheath
   j. Blade
   k. Node
   l. Blade
   m. Ligule
   n. Collar
   o. Shoot
   p. Auricle
   q. Sheath
   r. Crown
   s. Stolon
   t. Shoot
   u. Rhizome or underground stem
   v. Fibrous roots

10. Evaluated to the satisfaction of the instructor.

ORIENTATION AND GENERAL SAFETY
UNIT I

TERMINAL OBJECTIVES

After completion of Unit 1, the student should be able to define agricultural mechanics and list areas of study in an agricultural mechanics program. He should also be able to list occupations, identify tools, and list general safety precautions to observe in the shop. The knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define agricultural mechanics.
2. List two reasons why agricultural mechanics instruction is important to the agricultural industry.
3. Select from a list purposes for training in agricultural mechanical skills.
4. List ten steps in keeping a clean and orderly shop.
5. Match occupations in agricultural mechanics with the correct description.
6. List four purposes of the safety color code used in agricultural mechanics programs.
7. Discuss in a short paragraph, Kansas Law & Shop procedures regarding eye protection in the shop.
8. List steps to be taken involving accidents and first aid.
9. List three components of the fire triangle.
10. Match the four classes of fires with statements defining each class.
11. Match the types of fire extinguisher that is best suited to extinguish each class of fire.
12. Identify 30 common tools used in the agricultural mechanics shops.
13. Indicate a willingness to work safely by subscribing to the student safety pledge form.

ORIENTATION AND GENERAL SAFETY
UNIT I

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information sheet and safety pledge form
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information sheet
6. Give test

Student:

1. Read objective sheet
2. Study information sheet and take notes
3. Complete the safety pledge form
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheet
3. Transparency masters
    - TM 1--The Fire Triangle
    - TM 2--Types of Fire Extinguishers
    - TM 3--Common Tools
    - TM 4--Common Tools (Continued)
    - TM 5--Common Tools (Continued)
4. Assignment sheets
    - #1--Student Safety Pledge
    - #2--General Shop Safety Test
5. Answers to Assignment Sheet #2
6. Test
7. Answers to test

References:

1. Instructional Materials for Vocational Agricuture I . College Station, Texas: Teaching Materials Center, Agricultural Education Department, Texas A & M University.

2. Sneep, Neil O. Vocational Agriculture Training Programs: Safe Tractor Operation and Safe Farm Machinery Operation. East Lansing, Michigan: Rural Manpower Center, Michigan State University, 1969.

3. Schmidt, A. W., D. J. Witt, Loren Mills, and Charles Pearson "Safe Practices in the Vocational Agriculture Shop." Urbana, Illinois: Teachers of Vocational Agriculture, State of Illinois.

4. *Test Materials Handout and Job Sheets*, prepared by the Agricultural Engineering 4220 class, Summer, Professor George Cook. Stillwater, Oklahoma: Oklahoma State University, 1963.

5. Williams, William A. *Accident Prevention Manual for Shop Teachers*. Chicago, Illinois: American Technical Society, 1963.

6. Best's Safety Directory. Morriston, New Jersey: A. M. Best Co., 1968.

7. Ross, Henry and R. N. Craig, *Modern Farm Shop*. Austin, Texas: Steck-Vaughn Col, 1954.

8. *A Guide for Course Planning in Introduction to Agriculture*. Raleigh, North Carolina: Division of Vocational Education, Agricultural Education Section, Department of Public Instruction.

9. Hollenberg, A. H. *How To Teach Arc Welding in Farm Mechanics*. Columbus, Ohio: The James F. Lincoln Arc Welding Foundation, 1958.

10. Hoover, Norman K. *Handbook of Agricultural Occupations*. Danville Illinois: Interstate Printers and Publishers, 1963.

11. Phipps, Lloyd J. *Mechanics in Agriculture*. Danville, Illinois: Interstate Printers and Publishers, Inc., 1970.

ORIENTATION AND GENERAL SAFETY
UNIT I

INFORMATION SHEET

I. Agricultural mechanics--All the unspecialized mechanical activities performed on the farm and in the home including instruction in the following areas:

A. Agricultural shopwork

(NOTE: This includes selection, sharpening, care and correct use of shop tools and equipment; woodwork and simple carpentry; sheet metal work; elementary forge work; electric arc and oxyacetylene welding; pipe fitting; simple plumbing repairs; and rope work.)

B. Agricultural power and machinery

(NOTE: This includes selection, management, adjustment, operation, maintenance, and repair (excluding major repair requiring specialized equipment and services) of gas engines, trucks, and tractors and principle machines used in farming and agriculturally oriented business and services.)

C. Rural electrification

(NOTE: This includes utilization of electricity in the home and in productive enterprises and selection, installation, operation, and maintenance of electrical equipment.)

D. Agricultural buildings and conveniences

(NOTE: This includes elementary scale drawing and plan reading; farmstead layout; functional requirements of houses, shelters, and storages; water systems; and septic tanks and sewage disposals.)

E. Soil and water management

(NOTE: This includes elementary leveling; land measurement and mapping; drainage; irrigation; terracing; contouring; and strip cropping.)

II. Importance of agricultural mechanics instruction to the agricultural industry

A. Most of the work involves some type of mechanical activity

B. Approximately 85% of machinery in operation is out of adjustment

C. Must be able to service and maintain all the equipment used

INFORMATION SHEET

III. Purposes for training in agricultural mechanic skills

- A. Aids students in discovering mechanical aptitudes
- B. Trains students in basic skills needed on the farm and for related agricultural industries
- C. Prepares students for future training in mechanics
- D. Prepares students for entry into job opportunities after high school

IV. Steps in keeping a clean, orderly shop

- A. Store equipment being repaired or constructed in an orderly fashion at the end of the work period
- B. Clean and store tools, helmets, and goggles in their proper place at the end of the work period
- C. Report broken tools to the teacher
- D. Place oily rags in covered cans
- E. Turn off all arc welders when job is done
- F. Shut off oxyacetylene welding outfits at cylinders, drain hoses, close oxygen and acetylene blow pipe valves, clean welding tables, and restore rods to the holders at the close of the work period
- G. Be responsible for the area or station assigned to you
- H. Brush all benches, tables and the floor at end of work period
- I. Keep tools in their proper places
- J. Do not scuffle or join in horseplay in the shop
- K. Do not run in the shop
- L. Do not work with tools with which you have not received instruction
- M. Make sure that all electrical equipment is turned off at the end of the day
- N. Use tools for their specific purpose
- O. Supply all visitors with face shields upon entering the shop
- P. Store personal property including project property in designated locations

INFORMATION SHEET

Q. Do not waste time

(NOTE: Conduct in the shop should be the same as that of regular class time.)

R. Check all clothes before returning them to lockers afer class time

V. Description of agricultural mechanics occupations

A. Welder--Repairs and builds equipment

B. Farm machinery operator--Operates farm equipment as a farm employee

C. Mechanic--Repairs and overhauls engines, hydraulic systems, electric systems, etc.

D. Mechanic's helper--Assists mechanic and is in training to become a mechanic

E. Farm machinery parts manager--Handles parts and repairs in a machinery dealership

F. Farm machinery salesman--Works with a dealership selling farm machinery and equipment

G. Farm machinery fieldman--Assists farmers with problems in operating their equipment

VI. Purposes of the safety color code

A. Reduces glare by diffusing sufficient light for better vision throughout the shop

B. Reduces eyestrain, tension, and fatigue by "setting off" material from machines and work areas

C. Promotes safety by pointing out critical parts and areas

D. Promotes better housekeeping by providing a more pleasing environment

(NOTE: Colors used in the safety code as applied to the shop are given below.)

Green -- Applied to non-critical parts of equipment and machined surfaces, nameplates, and bearing surfaces; used to designate the location of safety and first aid equipment

Yellow -- Applied to operating levers, wheels, handles, and hazardous areas which may cause stumbling, falling, or tripping; used to designate caution

INFORMATION SHEET

Orange -- Applied to electrical switches, interior surfaces of doors on fuse and electrical power boxes, movable guards and parts, inside of non-movable guards, traffic lanes and overhead hazards; used to designate dangerous parts of equipment which may cut, crush, shock, or otherwise injure

Red -- (Physical color associated with fire) Used to identify the location of fire fighting equipment

(NOTE: Emergency fire exits shall be designated in red. Buttons or levers for electrical switches used for the stopping of machinery should be designated in red. Gasoline cans should be painted red with additional identification in the form of a yellow band around the can and the word GAS printed on the band.)

Blue -- Used as the basic color for designating caution against starting equipment while it is being worked on or against the use of defective equipment

(NOTE: A blue tag should be attached to defective equipment. The tag should be lettered "Out of Order.")

Ivory -- Can be applied to table edges, vise jaws, and edges of tool rests to reflect light and "show the way"

Aluminum-- (Also unpainted steel) Can be applied to tops of tables and work areas to provide contrast with work

VII. Summary of Kansas Law & Shop Procedures regarding eye protection in shops

A. EYE PROTECTIVE DEVICES--ARE REQUIRED TO BE WORN IN CERTAIN COURSES OF INSTRUCTION

B. Protects student and teacher participating in or observing instruction

C. Cautions against harmful conditions

1. Hot molten metals or other molten materials

2. Milling, sawing, turning, shaping, cutting, grinding, or stamping of any solid materials

3. Heat treatment, tempering, or kiln firing of any metal or other materials

4. Gas or electric arc welding or other forms of welding processes

INFORMATION SHEET

5. Repair or servicing of any vehicle where there is danger of injury to the eyes

6. Caustic or explosive materials

VIII. Steps to be taken involving accidents and first aid

A. Report all accidents to the teacher immediately

(NOTE: If a serious injury is apparent, the hospital or school nurse should be contacted immediately. Do not attempt to move the victim until help arrives.)

B. Use basic first aid

1. Stop the bleeding

2. Clear the airway

3. Treat for shock

IX. Components of the fire triangle (Transparency 1)

A. Fuel--Any combustible material

B. Oxygen--Necessary to sustain combustion

C. Heat--Enough to raise the fuel to its ignition temperature

(NOTE: To produce fire these three elements are necessary and must be present at the same time. If any one of the three is missing, a fire cannot be started or with the removal of any one of them, the fire will be extinguished.)

X. Classes of fires

A. Class A--Fires that occur in ordinary combustible materials, such as wood, rags, and rubbish

B. Class B--Fires that occur with flammable liquids, such as gasoline, oil, grease, paints, and thinners

C. Class C--Fires that occur in or near electrical equipment, such as motors, switchboards, and electrical wiring

D. Class D--Fires that occur with combustible metals, such as magnesium

XI. Types of fire extinguishers (Transparency 2)

A. Pressurized water--Operates usually by squeezing a handle or trigger; used on Class A fires

INFORMATION SHEET

B. Soda acid--Operates by turning extinguisher upside down; used on Class A fires

C. Carbon dioxide (CO_2)--Operates usually by squeezing a handle or a trigger; used on Class B and C fires

D. Dry chemical--Operates usually by squeezing a handle, a trigger, or lever; used on Class B, C, and D fires

E. Foam--Operates by turning extinguisher upside down; used on Class A and B fires

XII. Common tools used in agricultural mechanics shops (Transparencies 3,4, and 5)

A. Dividers

B. Inside calipers

C. Outside calipers

D. Welder's chipping hammer

E. Burr reamer

F. Hand drill

G. Adjustable hacksaw

H. Jack plane

I. Carpenter's brace

J. Ripsaw

K. Wire brush

L. Crosscut saw teeth

M. Ripsaw teeth

N. Machinest's vise

O. Adjustable wrench

P. Slip-joint pliers

Q. Bolt cutter

INFORMATION SHEET

R. Combination wrench

S. Ball-peen hammer

T. Soldering copper

U. Open-end wrench

V. Standard screwdriver

W. Carpenter's level

X. Wood chisel

Y. Steel-framing square

Z. Vise-grip pliers

AA. Wrecking bar

BB. Pipe wrench

CC. Tinner's snips

DD. Combination square

EE. Pipe cutter

FF. Steel tape

GG. Tap wrench

HH. Allen wrench

II. Diestock

JJ. Curved claw hammer

KK. Flat file

LL. C-clamp

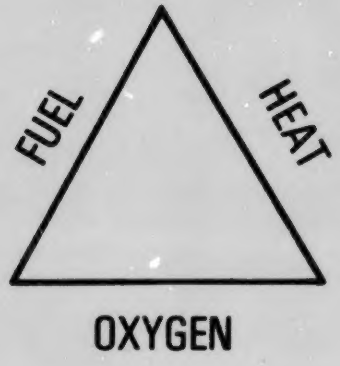
MM. Folding rule

NN. Round file

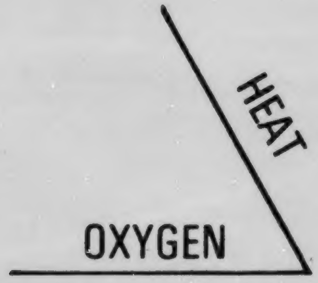
OO. Phillips screwdriver

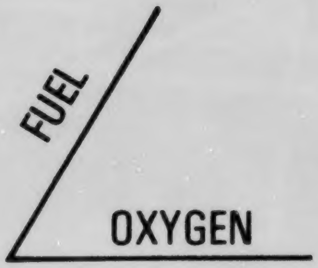
The Fire Triangle

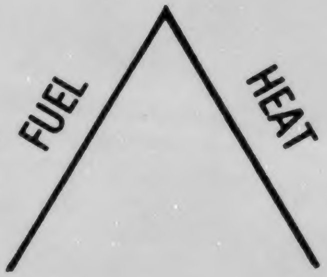
To produce fire, three things must be present at the same time.


FUEL
HEAT
OXYGEN

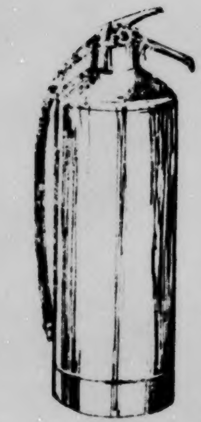
If any one of the three is missing, a fire cannot be started or, with the removal of any one , the fire will be extinguished.


HEAT
OXYGEN

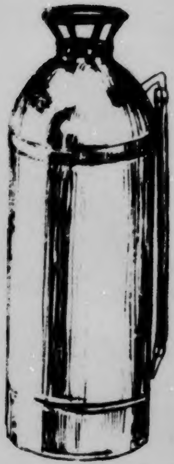

FUEL
OXYGEN



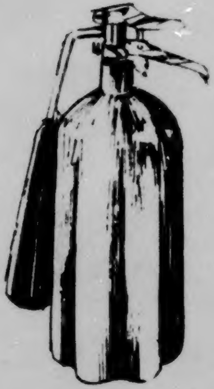
Types of Fire Extinguishers



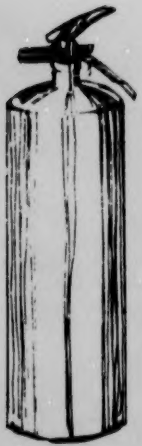
Pressurized Water



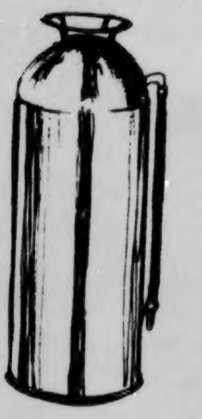
Soda-Acid



Carbon Dioxide

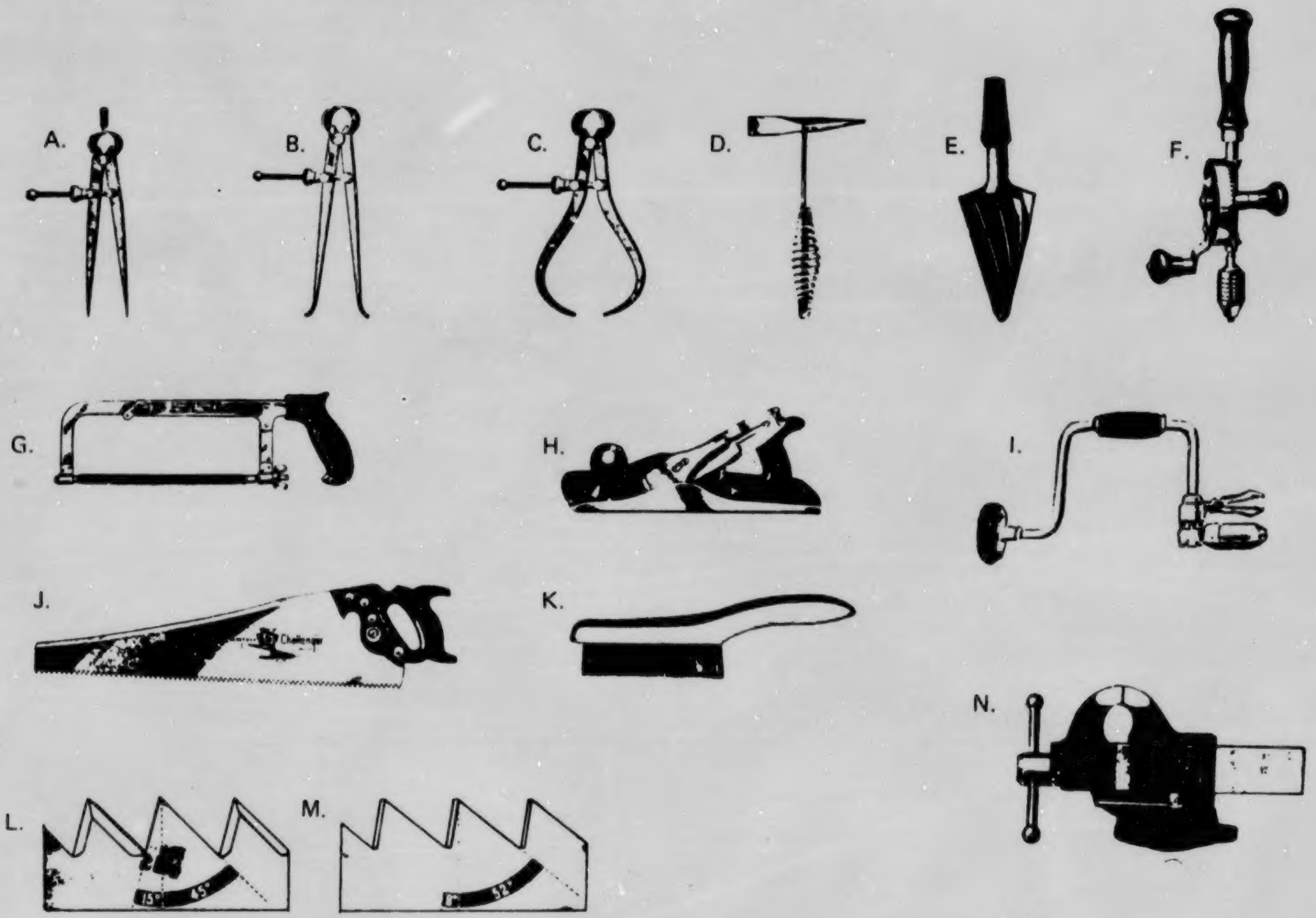


Dry Chemical



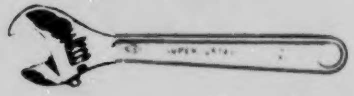
Foam

Common Tools


A.
B.
C.
D.
E.
F.
G.
H.
I.
J.
Challenger
K.
N.
L.
15°
45°
M.
8°
52°

Common Tools
(Continued)

O.



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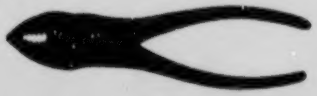

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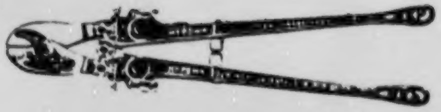

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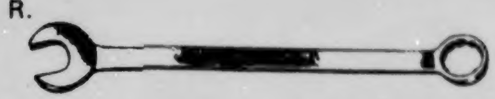

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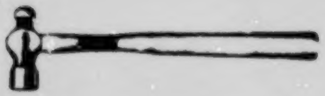

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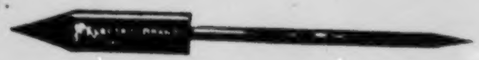

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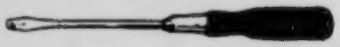

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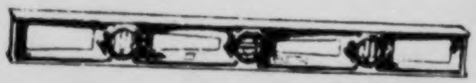

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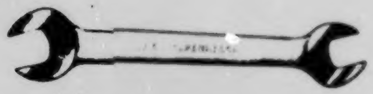

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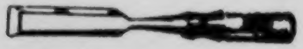

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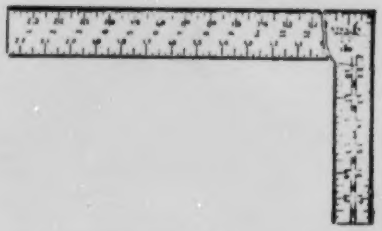

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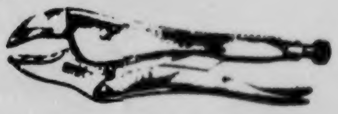

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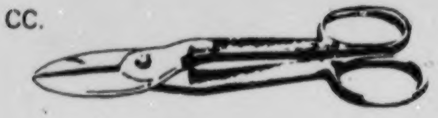
BB.

CC.



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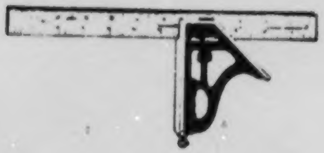

Common Tools

(Continued)

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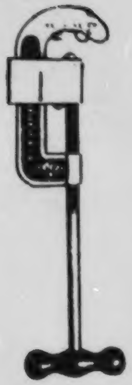

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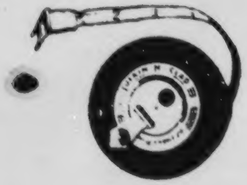

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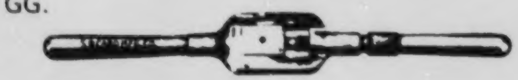

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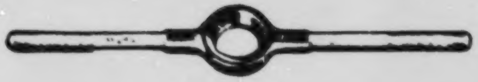

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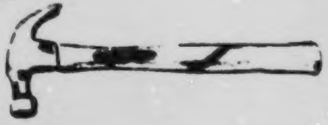

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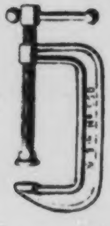

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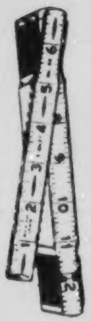

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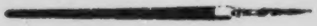

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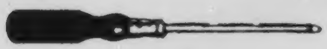

ORIENTATION AND GENERAL SAFETY
UNIT I

ASSIGNMENT SHEET #1--STUDENT SAFETY PLEDGE

1. I pledge myself to follow all rules and regulations pertaining to the safety of myself and others.

2. I will constantly watch for any unsafe acts, practices, or conditions that might reduce the safety of myself or others.

3. I will report all unsafe acts, practices, or conditions to my teacher immediately.

4. I will do my job in a safe and orderly manner, so that I will not endanger the safety of myself or others.

5. I will report all injuries, no matter how slight, to the first aid department immediately.

6. I will keep my work place in a safe and orderly condition at all times.

7. I will promote and respectfully solicit the cooperation of all pupils in safety and good housekeeping.

8. I will bear in mind at all times that my job will be safe only as long as I make it safe.

9. I will never lose sight of the fact that accidents do not just happen, they are caused.

10. I will do these things with respect and mutual understanding in all my relations with my fellow pupils, because only in this way can I feel sure that I am doing everything within my power to make my room and my school a safer and better place in which to work.

ASSIGNMENT SHEET #1

SAFETY-PRACTICE FORM

__________________ HIGH SCHOOL

__________________________, who is enrolled in a vocational_____________ course, will, as a part of his shop experience, operate machines, providing that his parent or guardian gives written permission.

It is understood that each student will be given proper instruction, both in the use of the equipment and in correct safety procedures concerning it, before being allowed to operate it himself.

The student must assume responsibility for the following safe practices, and we therefore ask that he subscribe to the following safety pledge:

1. I promise to follow all safety rules for the shop.
2. I promise never to use a machine without first having permission from the teacher.
3. I will not ask permission to use a particular machine unless I have been instructed in it's use and have made 100% on the safety test given on that machine.
4. I will report any accident or injury to the teacher immediately.

Date____________________ Student's Signature___________________________

I hereby give my consent to allow my son to operate all machines and equipment necessary in carrying out the requirements of the course in which he is enrolled.

Date____________________ Parent's Signature____________________________

Parents are cordially invited to visit the shops to inspect the machines and to see them in operation at any time.

ORIENTATION AND GENERAL SAFETY
UNIT I

ASSIGNMENT SHEET #2--GENERAL SHOP SAFETY TEST

Answer the following by circling "T" if true and "F" if false.

T F 1. You should always learn the right way to do a job.

T F 2. Always work at a fast speed.

T F 3. Report all injuriers to instructor.

T F 4. Observe all warnings signs and tags.

T F 5. Unless you have been taught to operate a machine, stay away from it

T F 6. Never attempt to make an adjustment or clear a jam while a machine is running.

T F 7. Guards may be left off some machines.

T F 8. It is permissible to leave a machine running while not in use.

T F 9. Remove chuck wrenches from chucks immediately after wrench is used.

T F 10. Use only tools and equipment in good condition.

T F 11. Equip files with handles before using them.

T F 12. Always use the proper tool for the job.

T F 13. In lifting an object, be sure you have a good footing then jerk the object.

T F 14. Wear goggles when there is a chance of getting foreign material in your eye.

T F 15. When working on or near machinery, don't wear worn or ragged clothing.

T F 16. Before using a hammer, check the trademark.

T F 17. When chiseling metal, wear goggles and caution nearby students against sparks.

T F 18. To avoid flying metal chips, never use a chisel with a mushroom head.

T F 19. When using a cold chisel on an empty barrel, the barrel should be filled with air.

ASSIGNMENT SHEET #2

T F 20. Always put out the torch when it becomes necessary to readjust the work.

T F 21. Never use more than 15 psi of acetylene pressure.

T F 22. Always handle hot metal with gloves.

T F 23. Open cylinder valves quickly.

T F 24. Never use oil on oxyacetylene regulators.

T F 25. Never use oxygen as a substitute for compressed air.

T F 26. Release adjusting screw on oxygen regulator before opening cylinder valve.

T F 27. To light the oxyacetylene torch, use a match.

T F 28. It is permissible to adjust the arc welding machine while it is running.

T F 29. When striking an arc always say "cover."

T F 30. Do not use worn or frayed cables when running a welding machine

T F 31. First aid stations are marked with a red cross.

T F 32. "Horseplay" should never occur in the shop.

T F 33. Always have good ventilation when working.

____

Student Signature

ORIENTATION AND GENERAL SAFETY
UNIT I

ANSWERS TO ASSIGNMENT SHEET #2

1. T.
2. F
3. T
4. T
5. T
6. T
7. F
8. F
9. T
10. T
11. T
12. T
13. F
14. T
15. T
16. F
17. F
18. T.
19. F
20. T
21. T
22. F
23. F
24. T
25. T
26. T
27. F
28. F
29. T
30. T
31. F
32. T
33. T

ORIENTATION AND GENERAL SAFETY
UNIT I

TEST

1. Define agricultural mechanics.

2. List two reasons why agricultural mechanics instruction is important to the agricultural industry.

   a.

   b.

3. Select from the list below purposes for training in agricultural mechanic skills. Place an "X" in front of the statement that is correct.

   _____a. Aids students to continue their education

   _____b. Aids students in discovering mechanical aptitudes

   _____c. Prepares students for entry into job opportunities after high school

   _____d. Train students in basic skills needed on the farm and for related agricultural industries

   _____e. Prepares students for college entry

4. List ten steps in keeping a clean and orderly shop

   a.

   b.

   c.

   d.

   e.

   f.

   g.

   h.

   i.

   j.

5. Match occupations in agricultural mechanics with the correct description.

_____a. Operates farm equipment as a farm employee

_____b. Assists mechanic and is in training to become a mechanic

_____c. Works with dealership selling farm machinery and equipment

_____d. Repairs and builds equipment

_____e. Repairs and overhauls engines, hydraulic systems, electric systems, etc.

_____f. Handles parts and repairs in machinery dealership

_____g. Assists farmers with problems in operating their equipment

1. Welder
2. Farm machinery operator
3. Mechanic
4. Mechanic's helper
5. Farm machinery parts manager
6. Farm machinery salesman
7. Farm machinery fieldman

6. List four purposes of the safety color code used in agricultural mechanics programs.

a.

b.

c.

d.

7. Discuss in a short paragraph Kansas Law and Shop Procedures regarding eye protection in the shop.

8. List steps to be taken involving accidents and first aid.

a. Accidents

b. First aid

1.

2.

3.

9. List three components of the fire triangle.

   a.

   b.

   c.

10. Match the classes of fire with the correct statement defining each class.

    _____a. Fires that occur with flammable liquids, such as gasoline, oil, grease, paints, and thinners

    _____b. Fires that occur in ordinary combustible materials, such as wood, rags, and rubbish

    _____c. Fires that occur in or near electrical equipment, such as motors, switchboards, and electrical wiring

    _____d. Fires that occur with combustible metals, such as magnesium

    1. Class A
    2. Class B
    3. Class C
    4. Class D

11. Match the type of fire extinguisher best suited to extinguish each class of fire. Answers may be used more than once.

    _____a. Fires that occur with flammable liquids such as gasoline, oil, or grease

    _____b. Fires that occur in or near electrical equipment such as motors, switchboards, and electrical wiring

    _____c. Fires that occur in ordinary combustible materials such as magnesium

    1. Pressurized water
    2. Carbon dioxide (CO_2)
    3. Dry chemical
    4. Soda acid
    5. Foam

12. Identify 30 of the 41 tools below. Use the answer sheet provided making sure the tool identified matches the number of the tool and answer sheet.

(NOTE: Instructor may want to add additional tools.)

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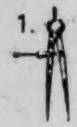
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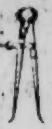
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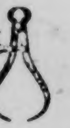
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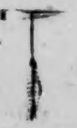
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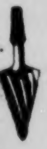
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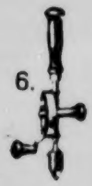
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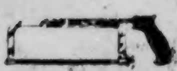
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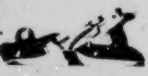
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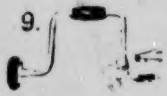
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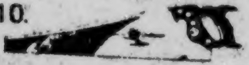
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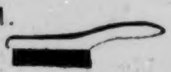
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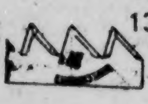
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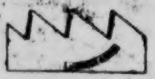
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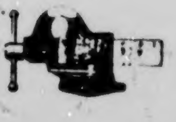
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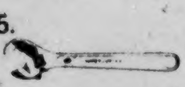
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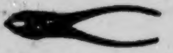
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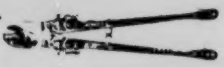
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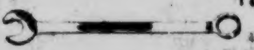
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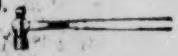
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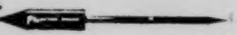
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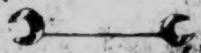
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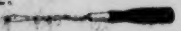
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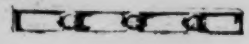
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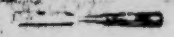
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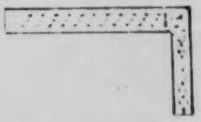
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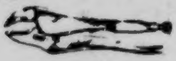
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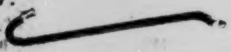
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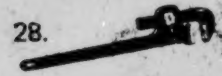
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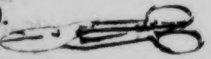
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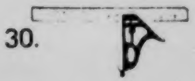
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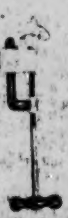
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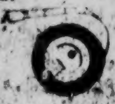
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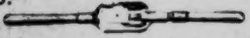
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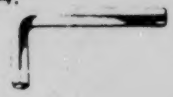
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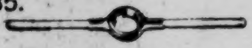
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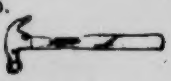
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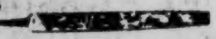
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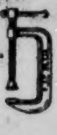
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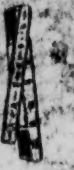
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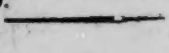
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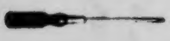

Ag. I - 37-F

ANSWER SHEET FOR TOOLS

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13. Indicate a willingness to work safely by subscribing to the student safety pledge form.

    (NOTE: If this has not been accomplished prior to the test, ask the instructor when the above activity should be completed.)

ORIENTATION AND GENERAL SAFETY
UNIT I

ANSWERS TO TEST

1. All the unspecialized mechanical activities performed on the farm and in the home including instruction in the following areas: agricultural shopwork, agricultural power and machinery, agricultural buildings and conveniences, rural electrification, and soil and water management

2. Any two of the following

   a. Most of the work involves some type of mechanical activity

   b. Approximately 85% of machinery in operation is out of adjustment

   c. Must be able to service and maintain all equipment used

3. b, c, d

4. Any ten of the following

   a. Store equipment being repaired or constructed in an orderly fashion at the end of the work period

   b. Clean and store tools, helmets, and goggles in their proper place at the end of the work period

   c. Report broken tools to the teacher

   d. Place oily rags in covered cans

   e. Turn off all arc welders when job is done

   f. Shut off oxyacetylene welding outfits at cylinders, drain hoses, close oxygen and acetylene blow pipe valves, clean welding tables, and restore rods to the holders at the close of the work period

   g. Be responsible for the area or station assigned to you

   h. Brush all benches, tables, and the floor at end of work period

   i. Keep tools in their proper places

   j. Do not scuffle or join in horseplay in the shop

   k. Do not run in the shop

   l. Do not work with tools with which you have not received instruction

   m. Make sure that all electrical equipment is turned off at end of day

   n. Use tools for their specific purpose

o. Supply all visitors with face shields upon entering the shop

p. Store personal property including project property in designated locations

q. Do not waste time

r. Check all clothes before returning them to lockers after class time

5. a. 2

   b. 4

   c. 6

   d. 1

   e. 3

   f. 5

   g. 7

6. a. Reduces glare by diffusing sufficient light for better vision throughout the shop

   b. Reduces eyestrain, tension, and fatigue by "setting off" material from machines and work areas

   c. Promotes safety by pointing out critical parts and areas

   d. Promotes better housekeeping by providing a more pleasing environment

7. Discussion should include:

   a. EYE PROTECTIVE DEVICES--ARE REQUIRED TO BE WORN IN CERTAIN COURSES OF INSTRUCTION

   b. Protects student and teacher participating in or observing instruction

   c. Cautions against harmful conditions

      1) Hot molten metals or other molten materials

      2) Milling, sawing, turning, shaping, cutting, grinding, or stamping of any solid materials

      3) Heat treatment, tempering, or kiln firing of any metal or other materials

      4) Gas or electric arc welding or other forms of welding processes

5) Repair or servicing of any vehicle where there is danger of injury to the eyes

6) Caustic or explosive materials

8. a. Report all accidents to the teacher immediately

   b. Use basic first aid

      1) Stop the bleeding

      2) Clear the airway

      3) Treat for shock

9. a. Heat

   b. Fuel

   c. Oxygen

10. a. 2

    b. 1

    c. 3

    d. 4

11. a. 2, 3, and 5

    b. 2 and 3

    c. 1, 4, and 5

    d. 3

12. 1. Dividers

    2. Inside calipers

    3. Outside calipers

    4. Welder's chipping hammer

    5. Burr reamer

    6. Hand drill

    7. Adjustable hacksaw

    8. Jack plane

    9. Carpenter's brace

10. Ripsaw
11. Wire brush
12. Crosscut saw teeth
13. Ripsaw teeth
14. Machinist's vise
15. Adjustable wrench
16. Slip-joint pliers
17. Bolt cutter
18. Combination wrench
19. Ball-peen hammer
20. Soldering copper
21. Open-end wrench
22. Standard screwdriver
23. Carpenter's level
24. Wood chisel
25. Steel-framing square
26. Vise-grip pliers
27. Wrecking bar
28. Pipe wrench
29. Tinner's snips
30. Combination square
31. Pipe cutter
32. Steel tape
33. Tap wrench
34. Allen wrench
35. Diestock

36. Curved claw hammer
37. Flat file
38. C-clamp
39. Folding rule
40. Round file
41. Phillips screwdriver

(Others as added by instructor.)

13. Evaluated to the satisfaction of the instructor.

ARC WELDING
UNIT II

TERMINAL OBJECTIVE

After completion of Unit II, the student should be able to select kinds of arc welders and equipment needed and list safety precautions observed in arc welding. He should also be able to strike an arc, run a bead, and construct a butt weld. This knowledge will be evidenced through actual demonstration and by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with arc welding to the correct definition.
2. List five safety precautions used in arc welding.
3. List two kinds of arc welders.
4. Select from a list common equipment used in arc welding.
5. List four types of electrodes.
6. Select from a list the two most common sizes of electrodes used in agricultural mechanics.
7. Identify the meaning of the numbers in the electrode classification system.
8. Name two methods of coating electrodes.
9. List three purposes of electrode coating.
10. Describe the effect of raising and lowering the arc welding current.
11. Name two methods of establishing an arc.
12. Select from a list characteristics of proper arc length.
13. Label the parts of a drawing associated with the welding process.
14. Identify three kinds of welds.
15. Identify five types of weld joints.
16. List four welding positions.
17. List four reasons for poor welds.
18. Name the five essentials for a proper welding procedure.

19. Demonstrate the ability to:
    a. Start, stop, and restart a bead.
    b. Construct a pad weld.
    c. Construct a butt weld.

ARC WELDING
UNIT II

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information and job sheets
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information sheet
6. Demonstrate and discuss procedures outlined in job sheets
7. Give test

Students:

1. Read objectives
2. Study information sheet and take notes
3. Demonstrate the ability to accomplish the procedures outlined in the job sheets
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheet
3. Transparency masters
    - TM 1--The Welding Circuits
    - TM 2--AC Arc Welder
    - TM 3--DC Arc Welder
    - TM 4--The Welding Hood
    - TM 5--Electrode Types
    - TM 6--AWS Classification of Electrodes
    - TM 7--Striking the Arc
    - TM 8--Welding Process
    - TM 9--Kinds of Welds
    - TM 10--Types of Weld Joints
    - TM 11--Welding Positions
    - TM 12--Build-up Operation
    - TM 13--Depositing Continuous Beads
    - TM 14--Bead Appearances
4. Job sheets
    - #1--Start, Stop, and Restart a Bead
    - #2--Construct a Pad Weld
    - #3--Construct a Butt Weld
5. Test
6. Answers to test

References:

1. Jones, M.M. Shopwork on the Farm. New York: McGraw-Hill Company, 1955.
2. Phipps, Lloyd J. Mechanics in Agriculture. Danville, Illinois: Interstate Printers and Publishers, Inc., 1967.
3. Kugler, Harold L. ARC Welding Lessons for School and Farm Shop. Cleveland, Ohio: The James F. Lincoln Arc Welding Foundation, 1964.
4. Hallenberg, A.H. How to Teach Arc Welding in Farm Mechanics. Cleveland, Ohio: The James F. Lincoln Arc Welding Foundation, 1958.
5. Hobart Welding School Workbook. Troy, Ohio: Hobart Brothers Technical Center.

ARC WELDING
UNIT II

INFORMATION SHEET

I. Terms and definitions

A. Arc--Flow of current across a narrow gap

B. Base metal--Metal to be welded

C. Bead weld--Made by one pass of the electrode

D. Bevel--Type of edge preparation

E. Butt joint--Weld between two metal parts on the same plane

F. Crater--Depression at the end of weld

G. Electrode--Metal rod which conducts a current from the electrode holder to the base metal

H. Welding--Joining of two or more pieces of metal together by the fusion process

(NOTE: In arc welding, heat is produced by the electric arc.)

I. AWS--American Welding Society

J. Arc Length--The distance from the end of the electrode core to the bottom of the crater

K. Bead--A continuous deposit of weld material

L. Chipping--Removal of slag by using light blow applied with a special hammer

M. Electrode coating--Extruded coating on electrode core that stabilizes and directs the arc, and produces a gaseous shield around the arc

N. Ground--Electrical connection between work and the welding circuit

O. Open Circuit Voltage--Voltage in the welding circuit when the welder is on but arc has not been established

P. Padding--Building up a surface by using a series of overlapping beads

Q. Peening--Stretching the weld area by hammering and reducing stresses

INFORMATION SHEET

R. Penetration--Depth of fusion produced by the weld

S. Polarity--Relates to DC welding and indicates direction of flow of welding current in the circuit

T. Slag--Deposit of impurities and materials from the electrode coating which solidify on top of the weld bead as it cools

U. Spatter--Hot slag of weld metal which is deposited outside or adjacent to the weld bead

V. Striking--The process of establishing the arc by scratching or tapping the electrode point against the base metal

W. Tack Weld--Small or short welds used to hold base metal parts in place prior to welding

X. Toe of Crater--The foremost part of the crater located in the direction of welding

II. Safety precautions in arc welding

A. Never look at the arc with the naked eye

B. Use a head or face shield that is in good condition

C. Wear suitable clothing to protect all parts of the body

Examples:
1. Long sleeved shirt
2. Leather gloves
3. Collar buttoned
4. Cuffs turned down
5. High topped shoes or boots

D. Do not strike an arc or weld until you are sure those in the vicinity have protective equipment or will look in the other direction

(NOTE: Yell "cover" before striking an arc.)

E. Do not weld around combustible or flammable materials

F. Do not pick up hot metal

G. Do not weld in confined places without ventilation

H. Always open main switch or disconnect plug when checking over a welder

INFORMATION SHEET

I. Do not leave electrode holder on welding table or in contact with grounded metal

J. Do not use worn or frayed cables

K. Stand on dry footing when welding

L. Keep area around welder clean

M. Keep tools and metals in proper location

III. Kinds of arc welders (Transparency 1)

A. AC--(Alternating current) Welder current alternates direction 120 times per second (Transparency 2)

B. DC--(Direct current) Welder current flows in the same direction (Transparency 3)

C. TIG--(Tungsten Inert Gas) Welder may use either AC or DC with a nonconsumable tungsten electrode and an inert shielding gas

D. MIG--(Metal Inert Gas) May use AC or DC with a base wire filler material that is fed automatically into weld; also has an inert shielding gas

IV. Common arc welding equipment

A. Welder

B. Electrode holder with lead

C. Ground clamp with lead

D. Shield or helmet (Transparency 4)

E. Gloves

F. Chipping hammer

G. Safety goggles

H. Wire brush

I. Electrodes

V. Types of electrodes (Transparency 5)

A. Mild steel

B. High carbon steel

C. Hard surfacing

INFORMATION SHEET

D. Alloys--Special purpose

VI. Common sizes of electrodes used in agricultural mechanics

A. 1/8"

B. 5/32"

(NOTE: Sizes of electrodes range from 1/16" to 3/8". Electrode size is determined by the diameter of the wire.)

VII. Meaning of numbers in the electrode classification system (Transparency 6)

A. E--Arc wleding electrode

B. 60-Tensile strength in thousand of pounds per square inch

C. 1--Position to be used

D. 1--Special characteristics

VIII. Methods of coating electrodes

A. Wrapping

B. Dipping

(NOTE: Electrodes are dipped into a liquid flux solution.)

C. Extruding

(NOTE: This is the most common method.)

IX. Purposes of electrode coating

A. Stabilizes the arc

B. Shields molten puddle from air

C. Floats impurities out of puddle

D. Forms slag and slows cooling

E. Increases speed and improves quality of weld

X. Effect of raising and lowering current

A. Raising current--Produces more heat

B. Lowering current--Produces less heat

(NOTE: On thicker metals more heat is necessary in order to get penetration.)

INFORMATION SHEET

XI. Methods of establishing an arc (Transparency 7)

- A. Scratching (similar to striking a match)
- B. Tapping

XII. Characteristics of proper arc length

- A. End of electrode is the same distance from the base metal as the diameter of electrode

  Example: 1/8" electrode--arc length 1/8"

- B. Correct arc length makes a steady hum of the welder and a "frying" sound at the arc

XIII. Parts of the welding process (Transparency 8)

- A. Electrode
- B. Wire core
- C. Coating (flux)
- D. Arc
- E. Gaseous shield
- F. Weld
- G. Slag
- H. Heat lines
- I. Base metal
- J. Penetration
- K. Crater
- L. 15 degrees-30 degrees
- M. Direction of travel

XIV. Kinds of welds (Transparency 9)

- A. Fillet
- B. Groove
- C. Bead

INFORMATION SHEET

XV. Types of weld joints (Transparency 10)

  A. Edge joint

  B. Butt joint

  C. Corner joint

  D. T joint

  E. Lap joint

XVI. Weld positions (Transparency 11)

  A. Flat

  B. Vertical

  C. Overhead

  D. Horizontal

XVII. Reasons for poor welds

  A. Machine adjustment too hot or too cold

  B. Electrode size too large or too small

  C. Improper movement of electrode

  D. Improper angle of holding electrode

  E. Improper base metal preparation

  F. Arc length too long or too short

XVIII. The five essentials for proper welding procedure

  A. Select Proper Electrode - Size and Type

  Consider - 1. Type joint to welded

  2. Position of weld

  3. Joint preparation

  4. Mass of work

  B. Select Correct Amperage

INFORMATION SHEET

Consider - 1. Size of electrode

2. Type of electrode
3. Kind of metal to be welded
4. Thickness and size of metal to be welded
5. Position of weld
6. Joint type to be welded
7. Joint preparation and fit-up

C. Use correct Travel Speed

Consider - 1. Affects size of bead and depth of penetration.

2. Excess buildup increases costs
3. Excess buildup causes distortion
4. Speed can be regulated by controlling puddling size. 1/8 " electrode use a 1/4 " puddle

D. Position the Electrode Correctly

1. Use correct ARC length
    a) Distance from metal core to bottom of crater
    b) A steady frying and crackling sound indicates correct length
    c) Arc length as a general rule should be approximately equal to wire core diameter of electrode
    d) Effect of too long and too short an arc - see TM #14
2. Use correct angle of electrode
    a) Base on type of weld to be made - Butt (groove) or fillet and position of weld - flat, vertical or overhead
    b) Improper electrode angles cause
        1) Poor penetration
        2) Under cutting
        3) Slag inclusions

INFORMATION SHEET

c) When doing butt (groove) welds in the flat position:

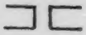
  1) The puddle should be circular in shape

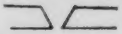
  2) Lean electrode 15-25 in direction of travel

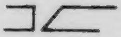
  3) Angle to side - varies as to thickness of pieces of metal to be joined. 90° if pieces are of equal thickness

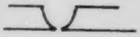
E. Use proper joint preparation and positioning

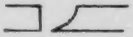
  1. Common joint preparation for butt (groove) welds are:

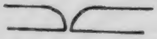
    a) Square 

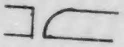
    b) Vee Bevel 

    c) Half Vee Bevel 

    d) U Bevel 

    e) J Bevel 

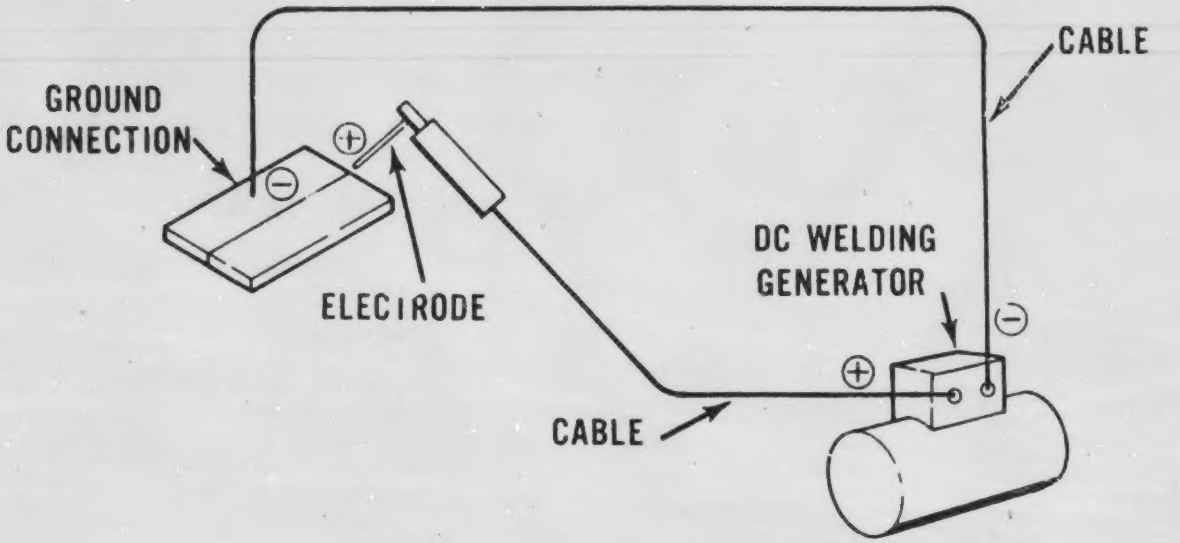
    f) Flare Vee Bevel 

    g) Flare Bevel 

  2. Joint preparation is done to provide for maximum penetration with a minimum of heat and distortion

  3. Thinner metal pieces may be spaced rather than shaped to give the desired effect

THE WELDING CIRCUIT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ELECTRODE
DC WELDING GENERATOR
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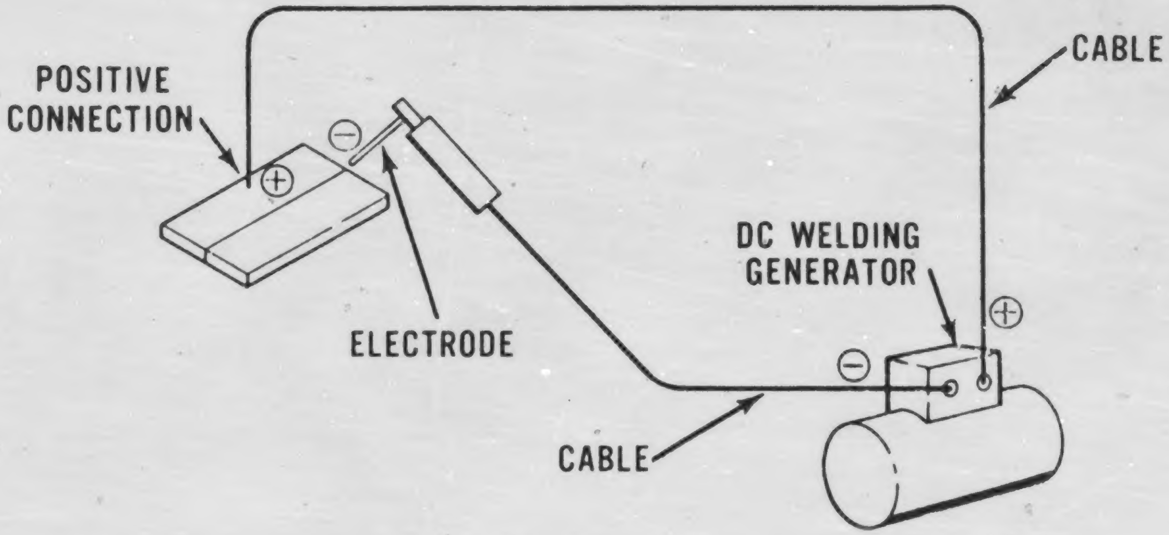
CABLE

POSITIVE OR REVERSE POLARITY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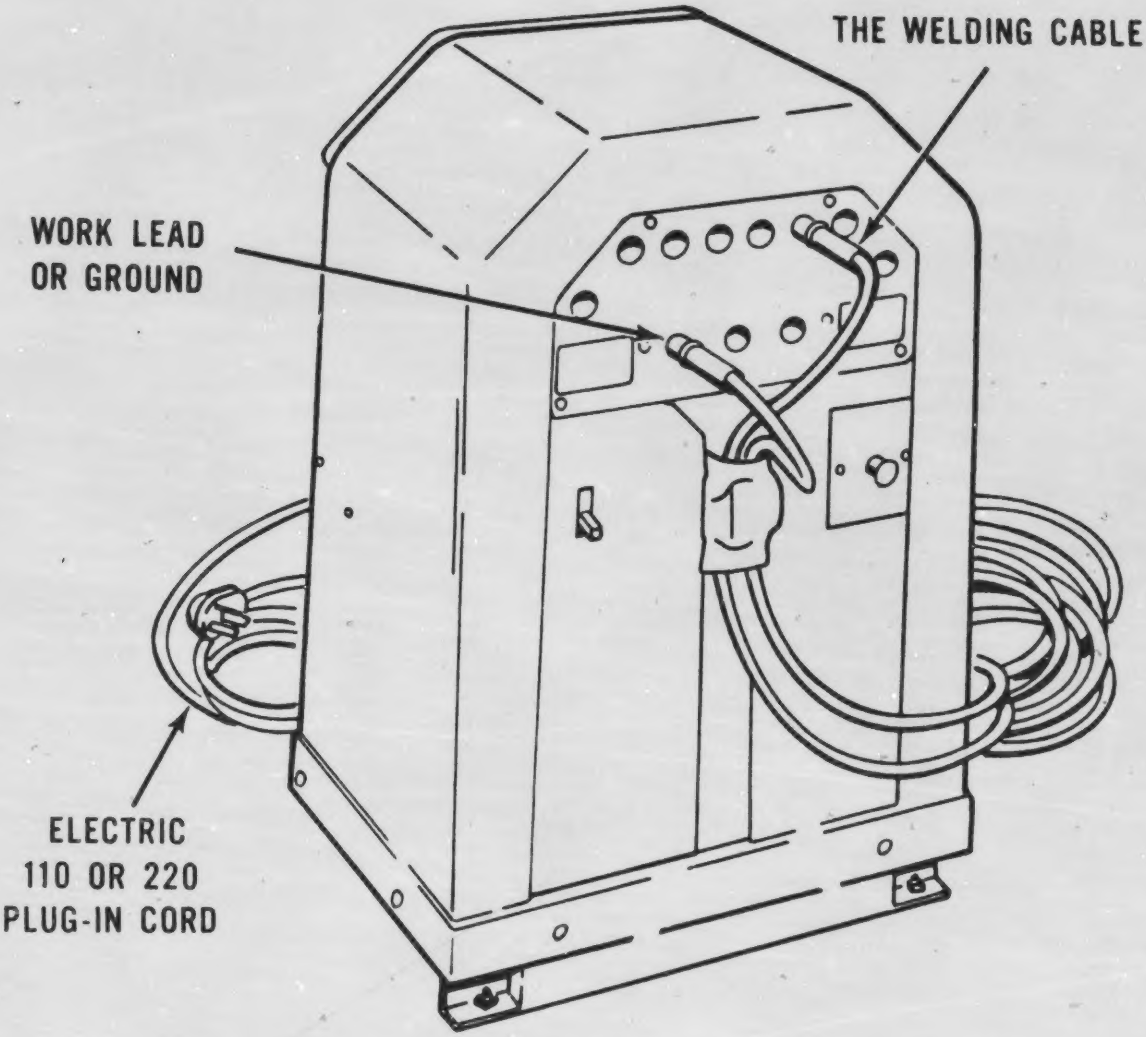
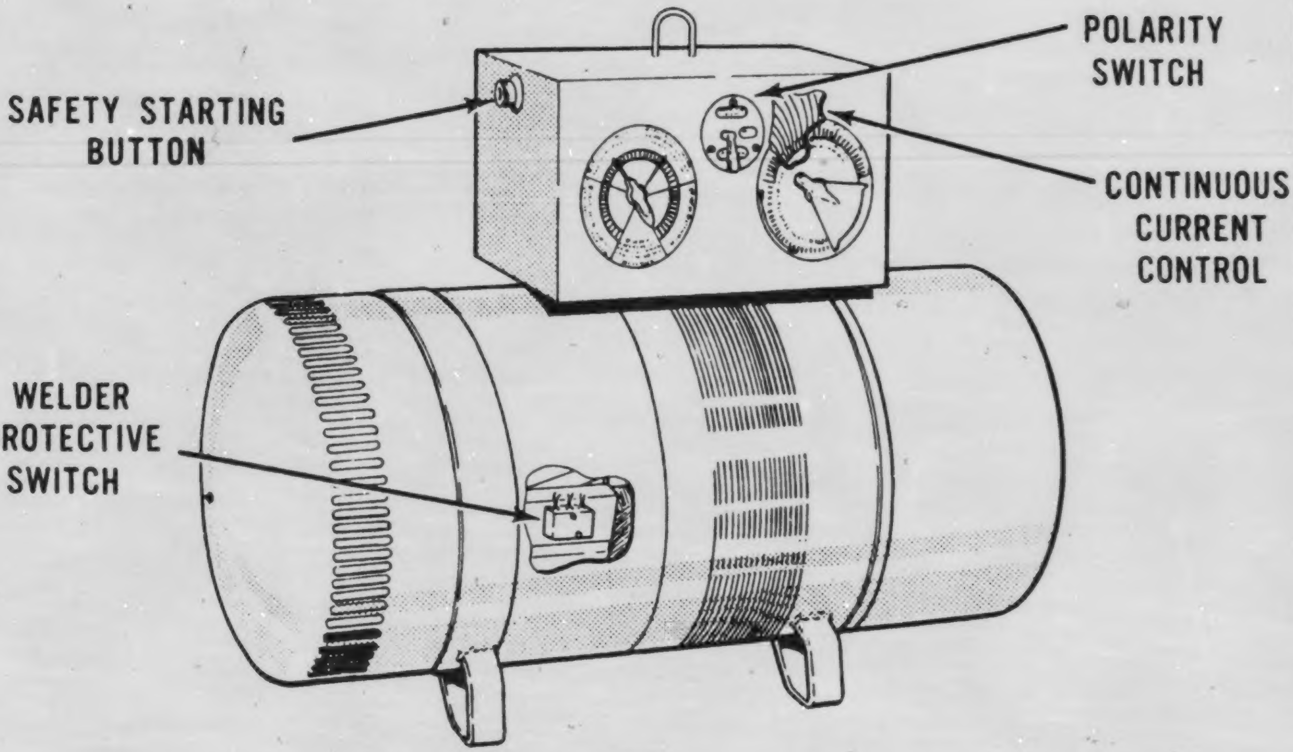
NEGATIVE OR STRAIGHT POLARITY

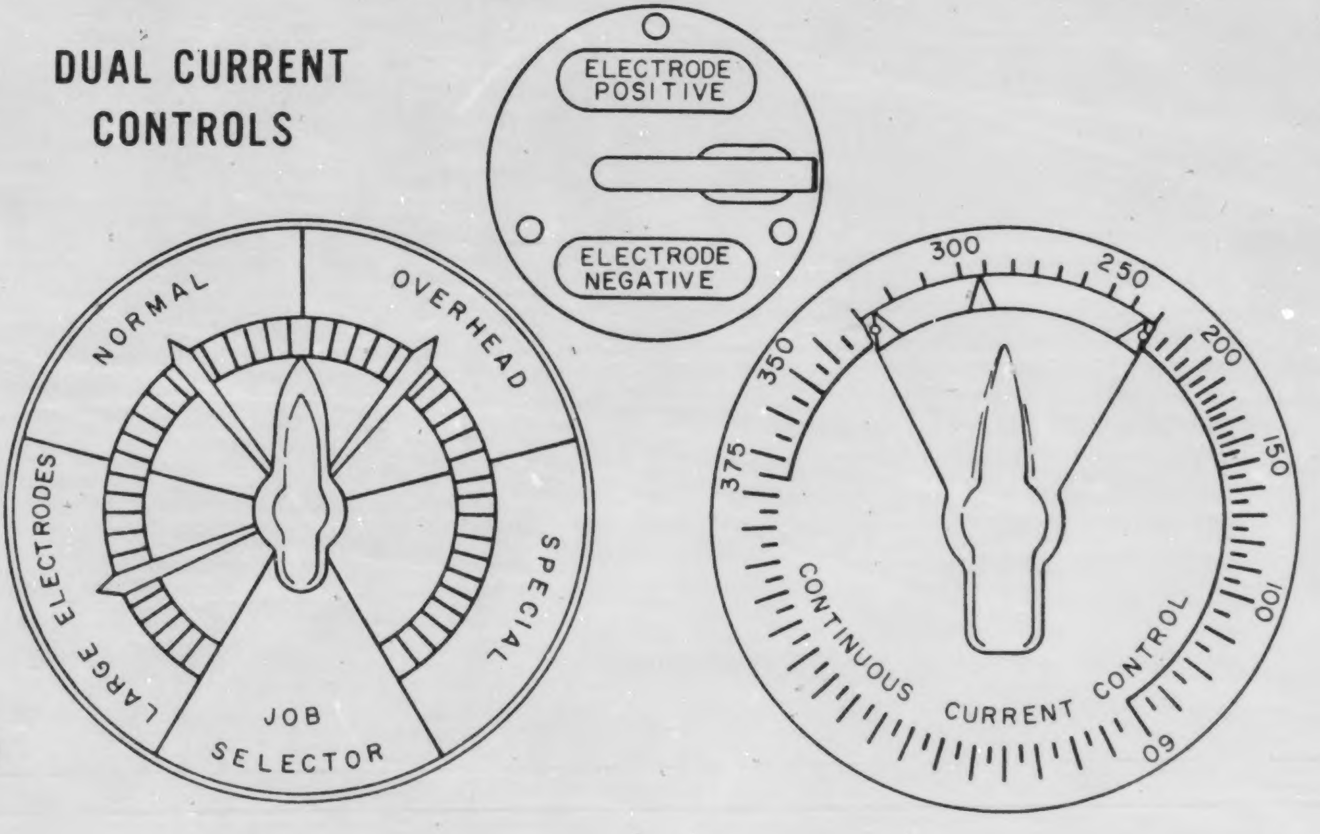
A-C ARC MACHINE


THE WELDING CABLE
WORK LEAD
OR GROUND
ELECTRIC
110 OR 220
PLUG-IN CORD

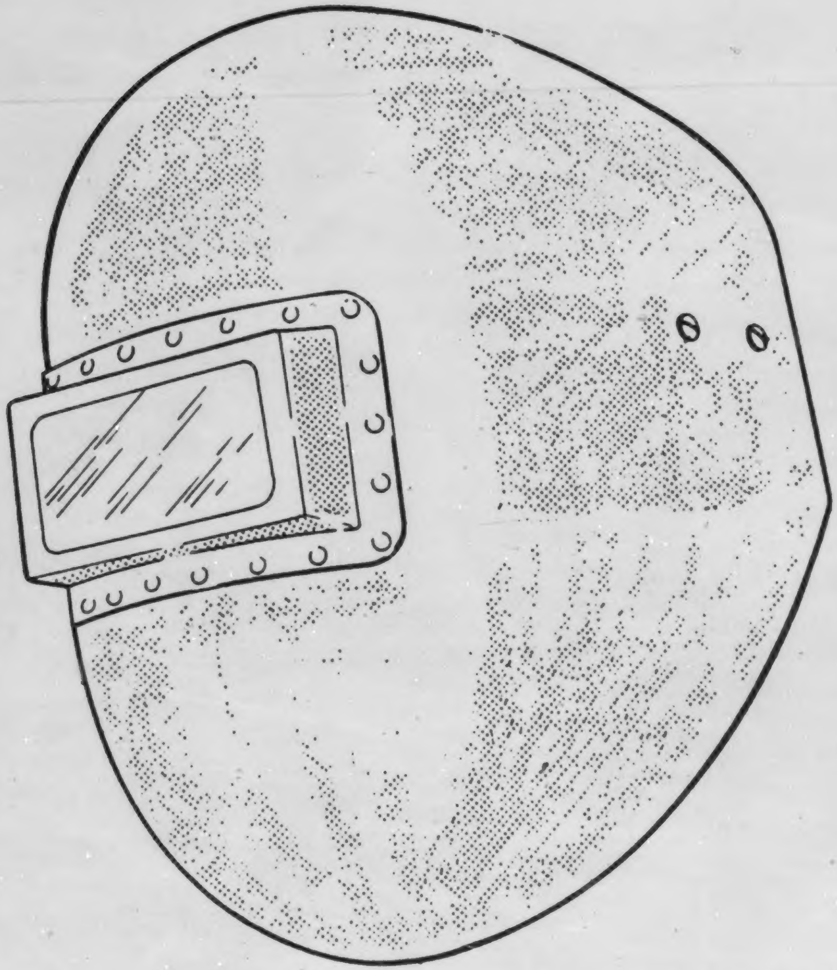
D-C ARC MACHINE

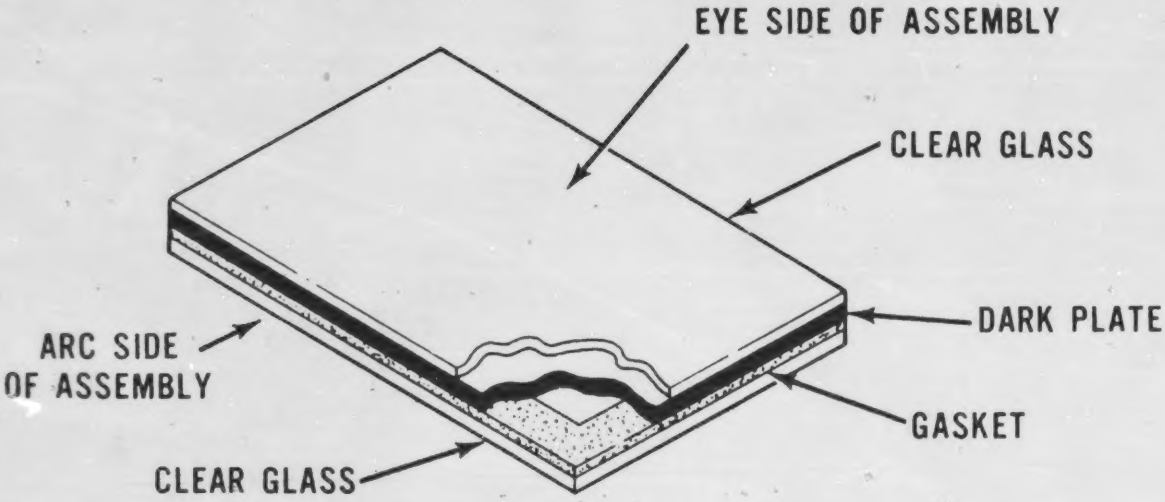

POLARITY SWITCH
SAFETY STARTING BUTTON
CONTINUOUS CURRENT CONTROL
WELDER PROTECTIVE SWITCH

DUAL CURRENT CONTROLS

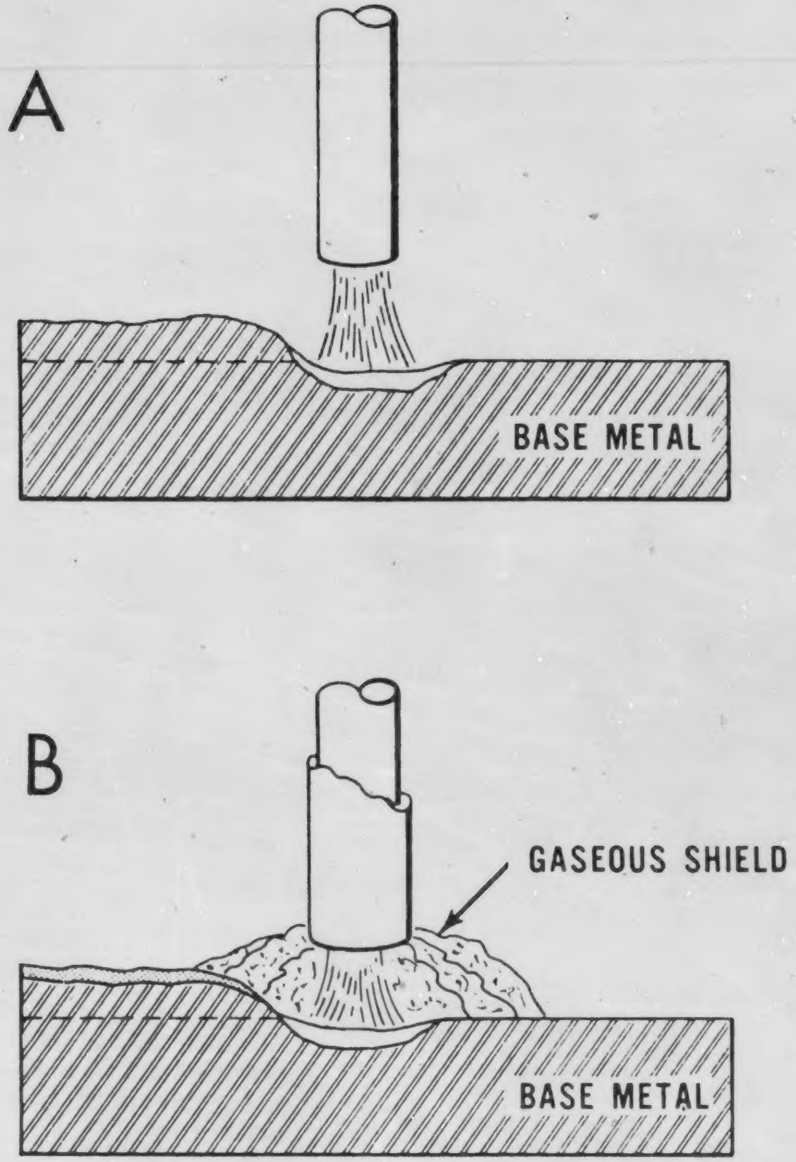

ELECTRODE POSITIVE
ELECTRODE NEGATIVE
NORMAL
OVERHEAD
SPECIAL
LARGE ELECTRODES
JOB SELECTOR
300
250
200
150
100
60
350
375
CONTINUOUS CURRENT CONTROL

THE WELDING HOOD



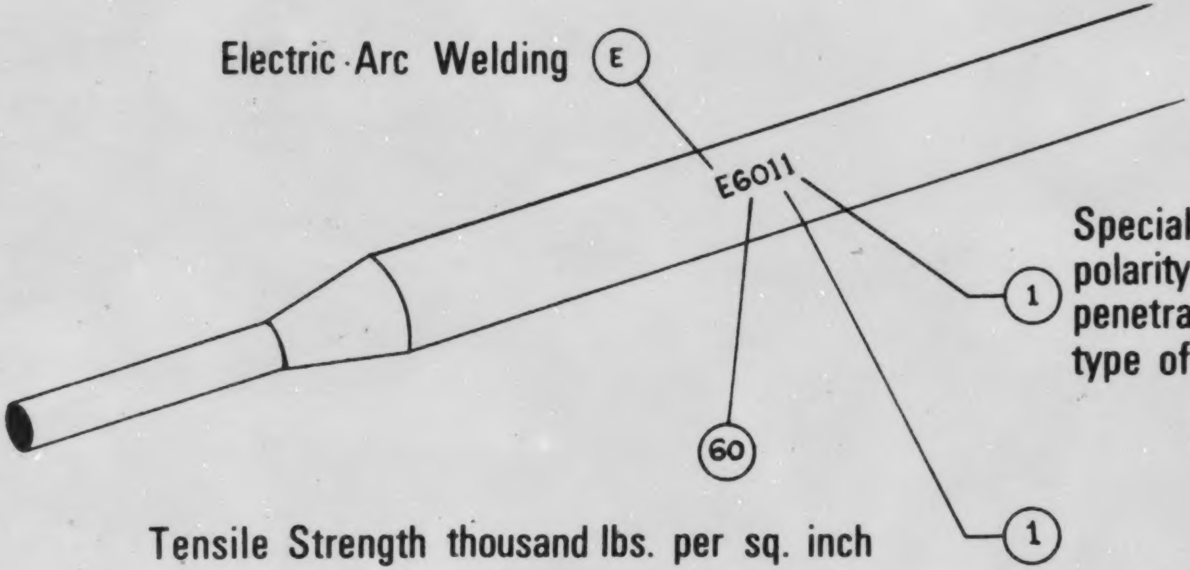

EYE SIDE OF ASSEMBLY
CLEAR GLASS
DARK PLATE
ARC SIDE OF ASSEMBLY
GASKET
CLEAR GLASS

ELECTRODE TYPES


A
BASE METAL
B
GASEOUS SHIELD
BASE METAL

A- BARE ROD (UNSHIELDED ARC) B- COATED ROD (SHIELDED ARC)

AWS Classification of Electrodes



Electric Arc Welding

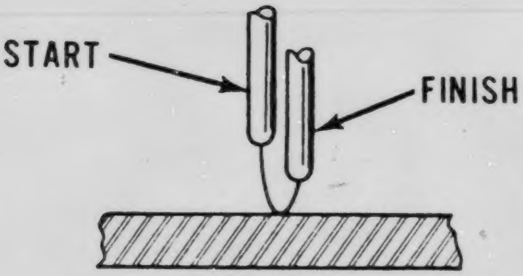
Special char.
polarity
penetration
type of welder

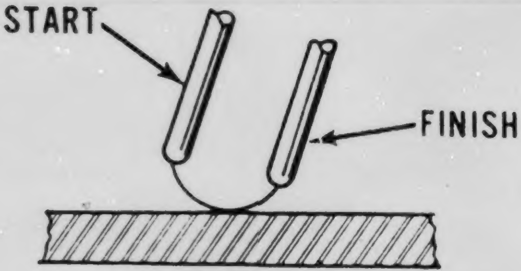
Tensile Strength thousand lbs. per sq. inch

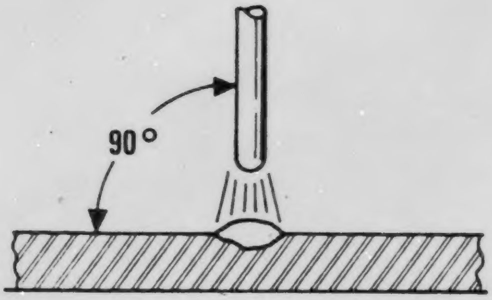
Welding Position
1. all positions
2. flat and horizontal
3. flat

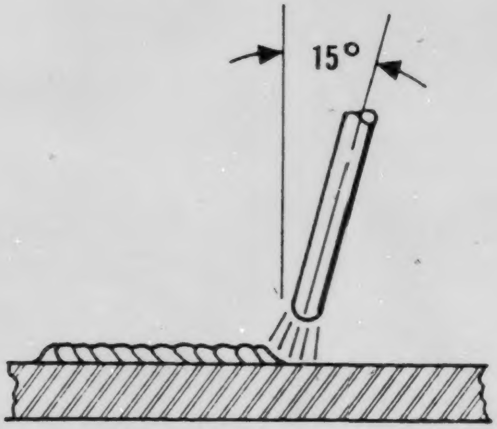
E6011 MILD STEEL ELECTRODE

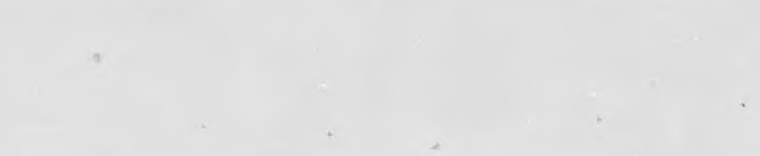
STRIKING THE ARC AND DEPOSITING SHORT BEADS


START
FINISH

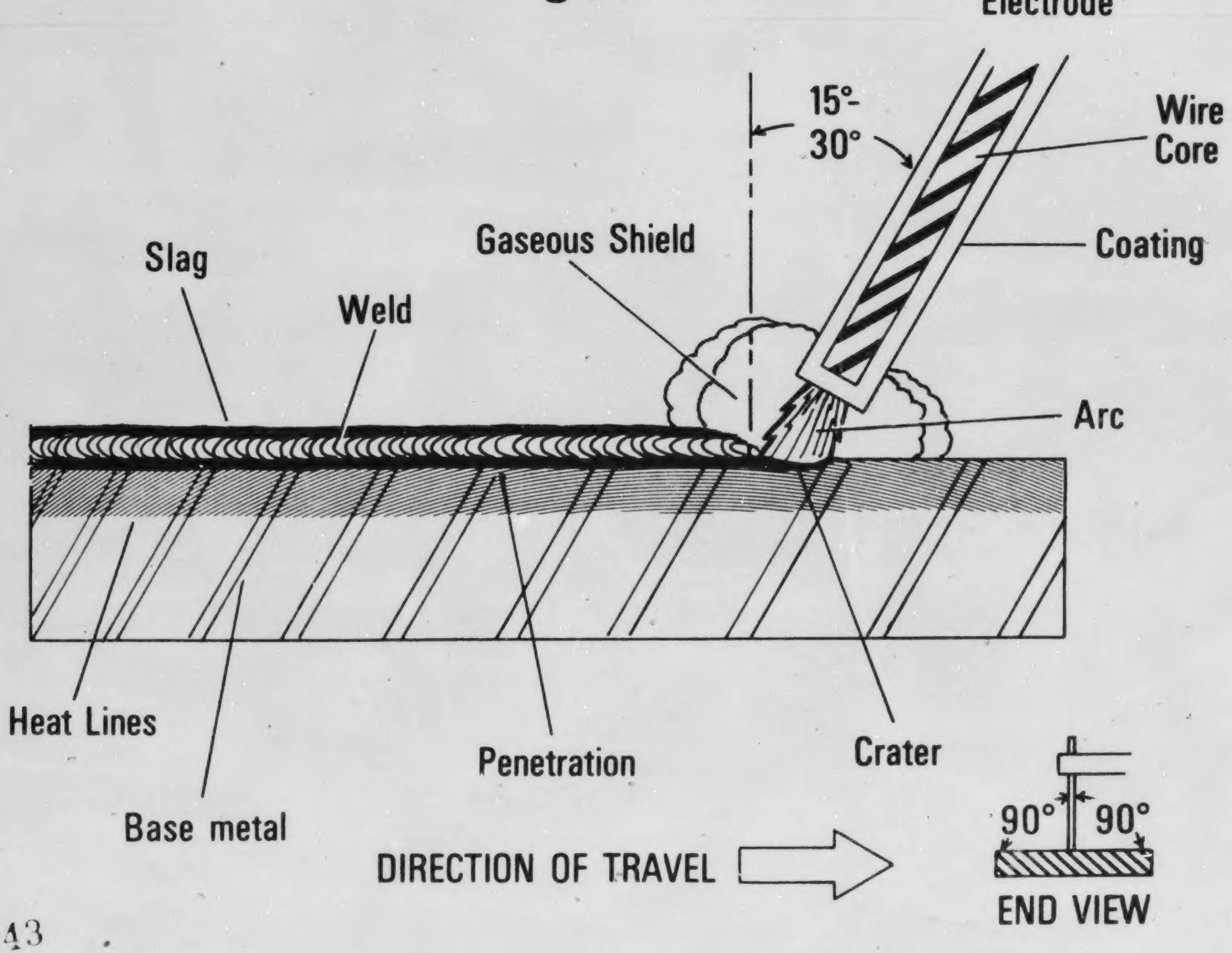

START
FINISH



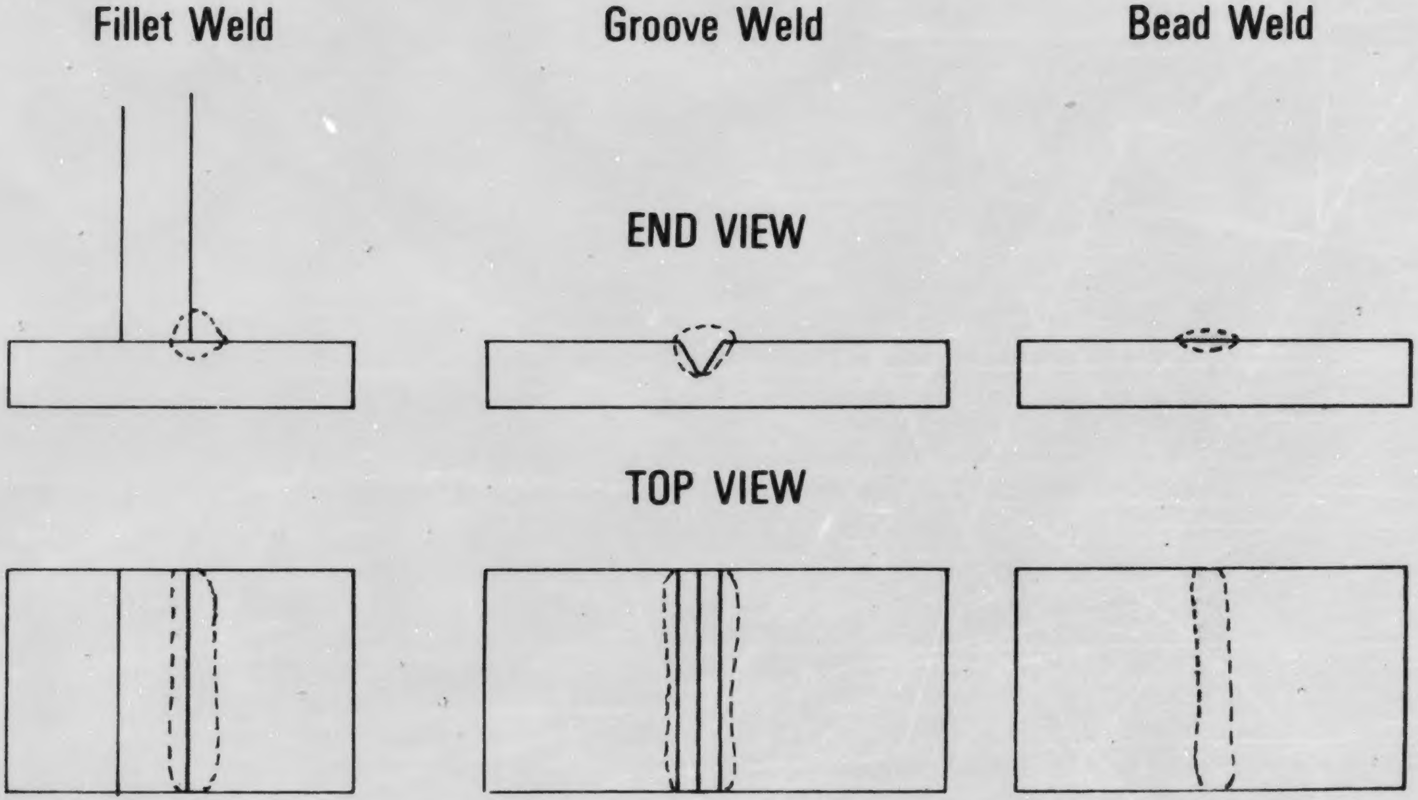



NO FUSION
OVERLAP

Welding Process


Electrode
15°-
30°
Wire
Core
Coating
Gaseous Shield
Slag
Weld
Arc
Heat Lines
Base metal
Penetration
Crater
DIRECTION OF TRAVEL
90°
90°
END VIEW

Kinds of Welds



Fillet Weld

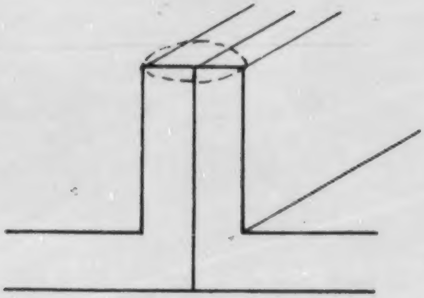
Groove Weld

Bead Weld

END VIEW

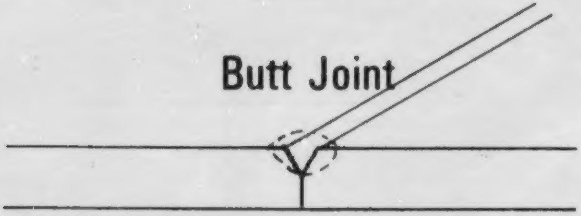
TOP VIEW

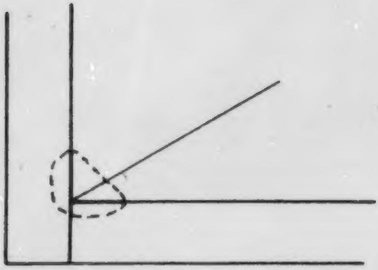
Types of Weld Joints



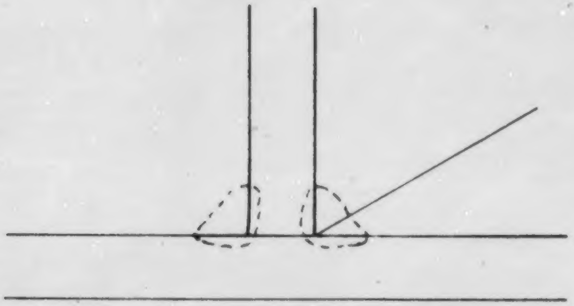
Edge Joint

Butt Joint

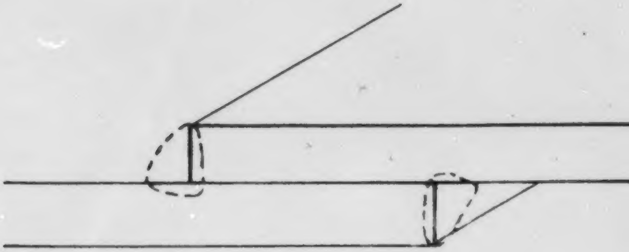




Corner Joint

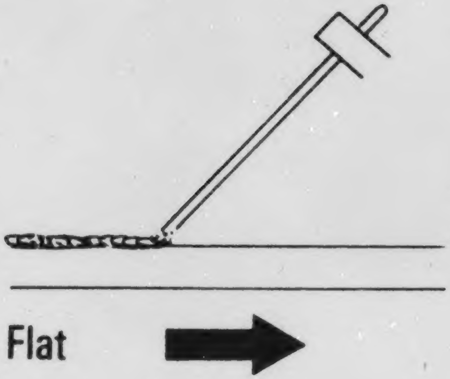


T Joint

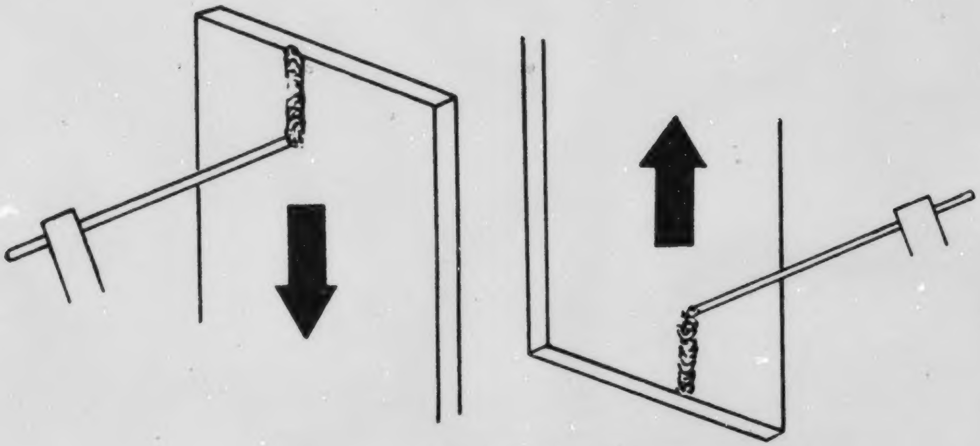


Lap Joint

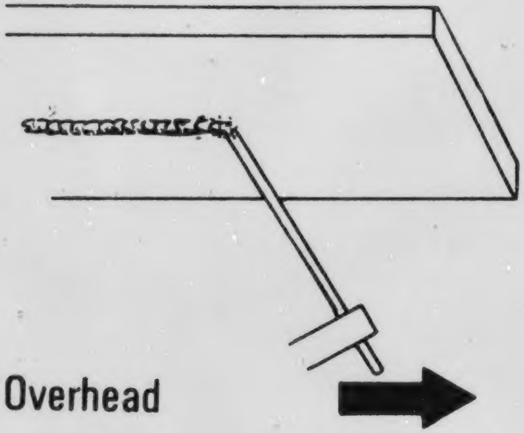
Welding Positions



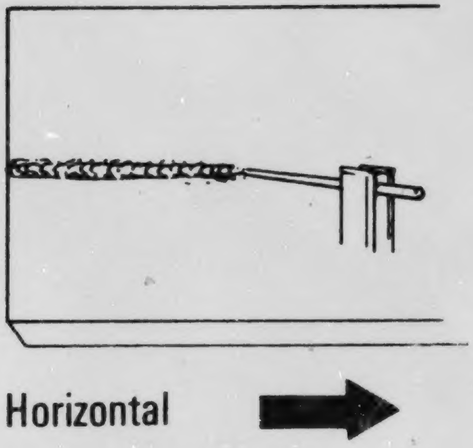
Flat



Vertical

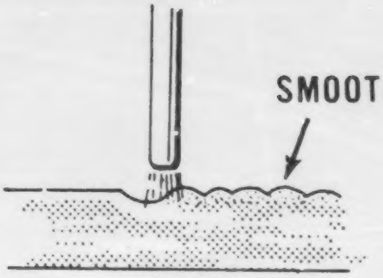


Overhead

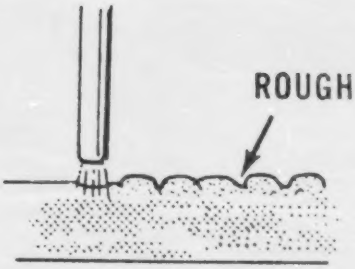


Horizontal

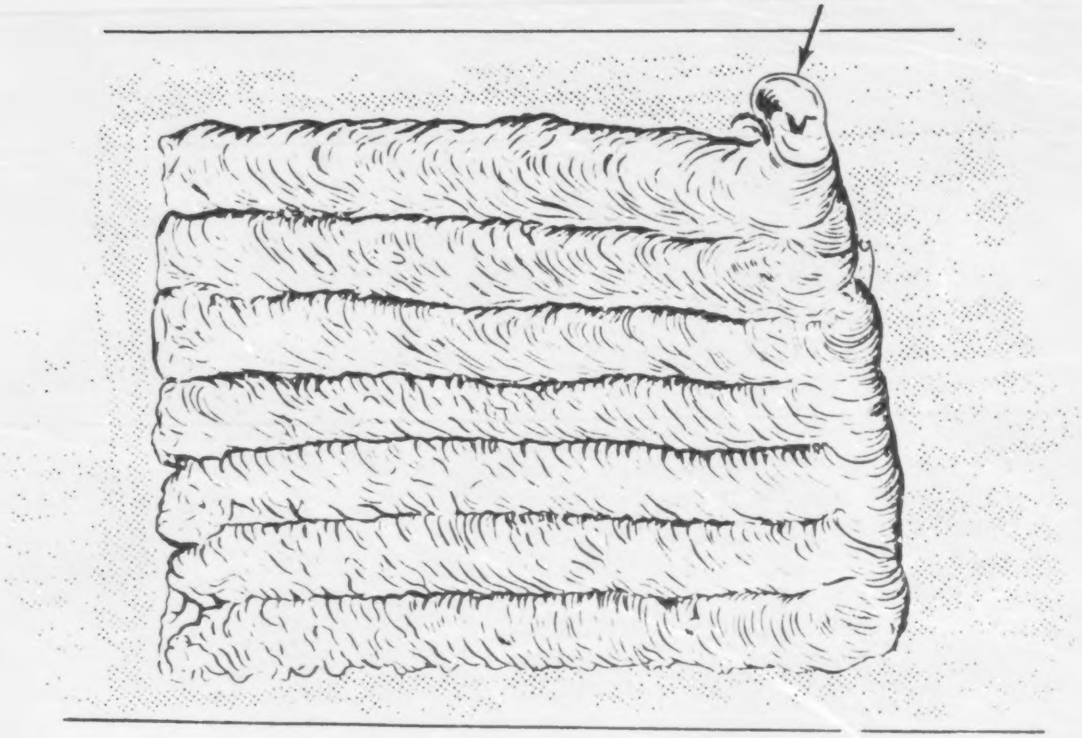
BUILD-UP OPERATION



CORRECT

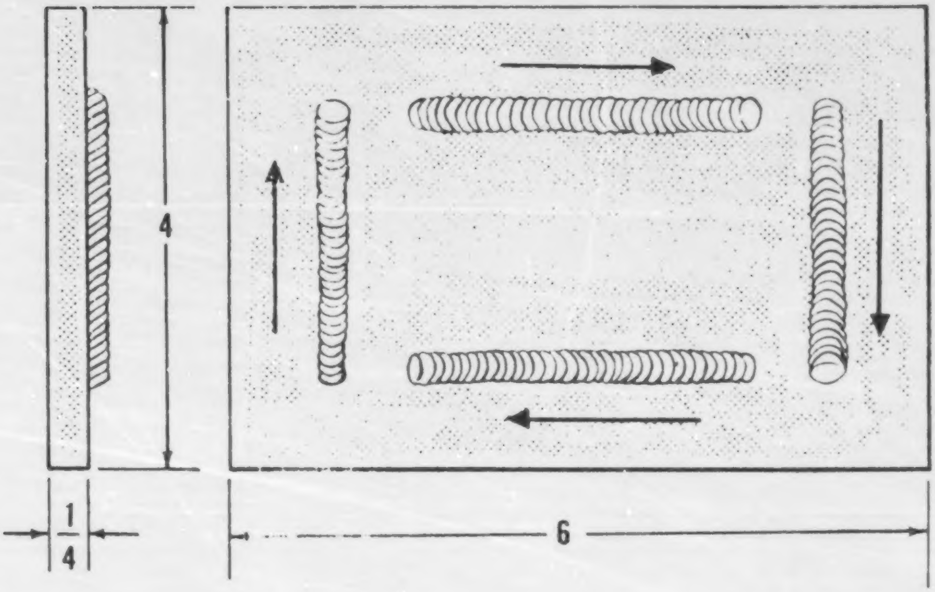


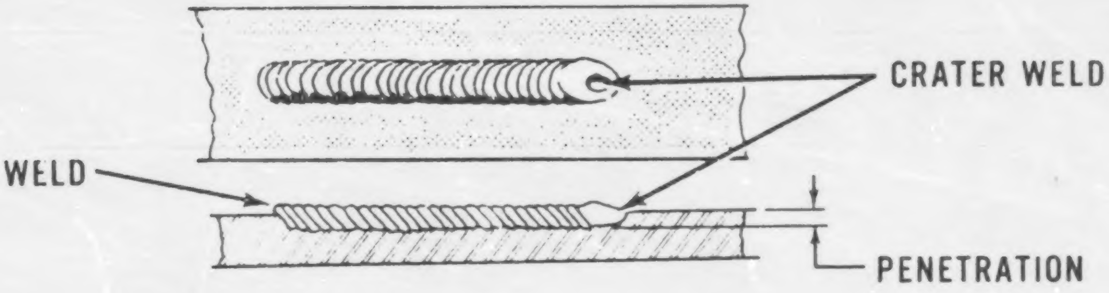
INCORRECT

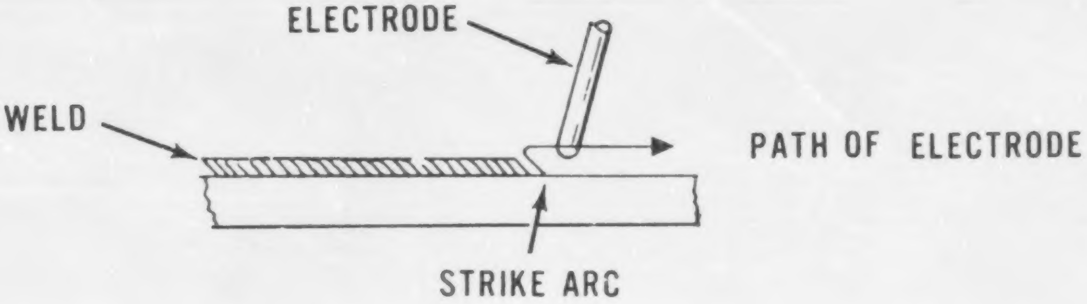


BEADS HOOKED GIVE FINISHED APPEARANCE

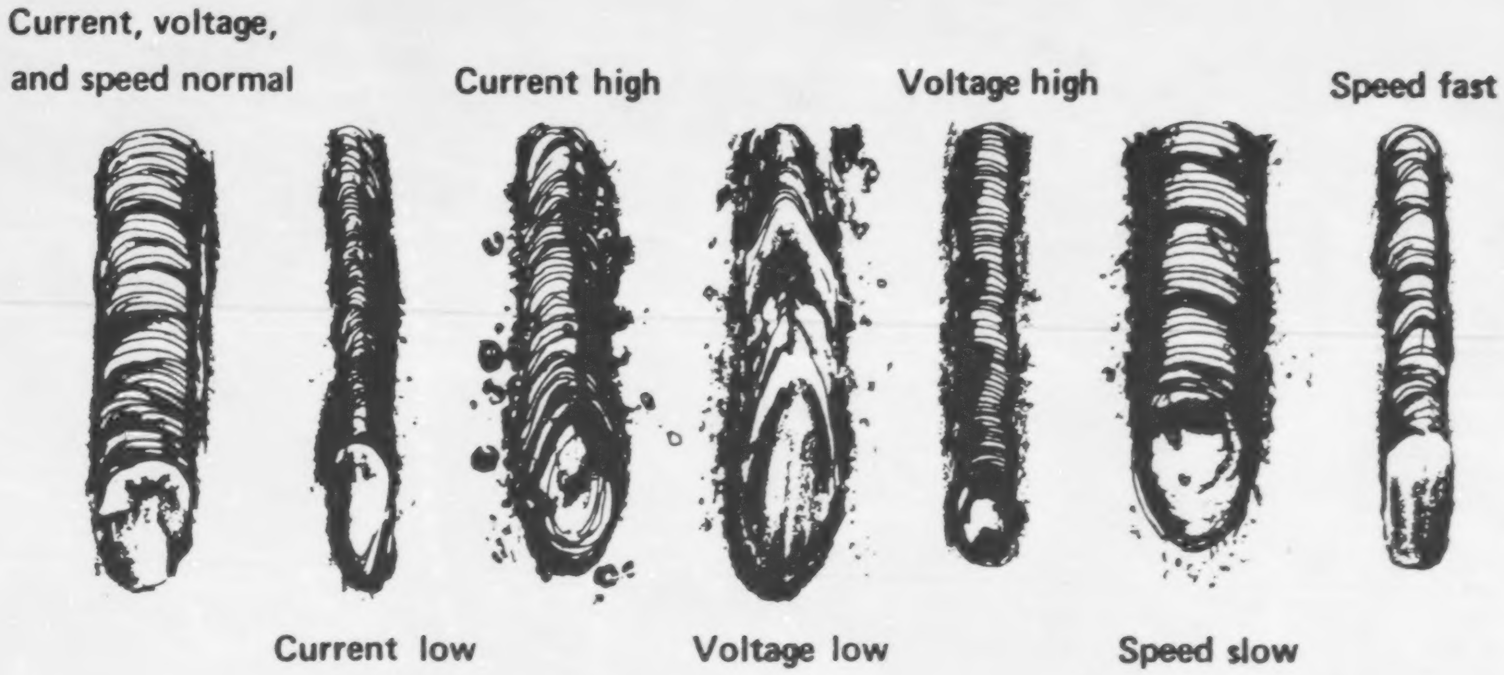
DEPOSITING CONTINUOUS BEADS




CRATER WELD
WELD
PENETRATION


ELECTRODE
WELD
PATH OF ELECTRODE
STRIKE ARC

Properly and Improperly Formed Beads


Current, voltage, and speed normal
Current low
Current high
Voltage low
Voltage high
Speed slow
Speed fast

ARC WELDING
UNIT II

JOB SHEET #1--START, STOP, RESTART A BEAD

I. Equipment, materials, and tools needed

- A. Piece of metal 1/4" to 3/8" thick, 4" x 4"
- B. Welder
- C. Electrode holder and lead
- D. Ground clamp and lead
- E. Helmet
- F. Gloves
- G. Electrodes
- H. Safety goggles
- I. Chipping hammer
- J. Wire brush

II. Procedure

- A. Prepare metal for welding
- B. Strike arc 1" from edge where bead is to begin (Figures 1 and 2)

FIGURE 1

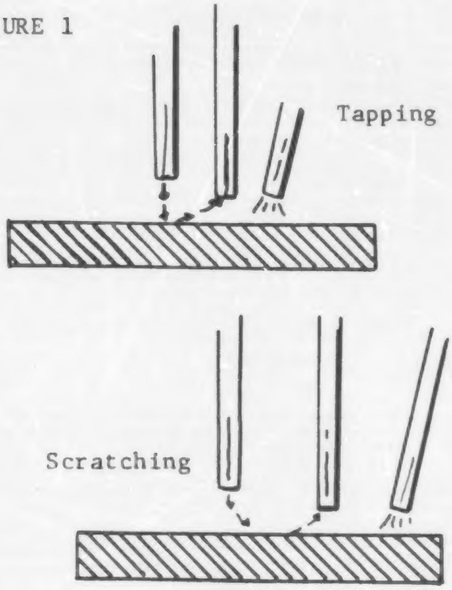
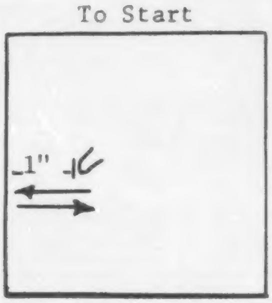


FIGURE 2



JOB SHEET #1

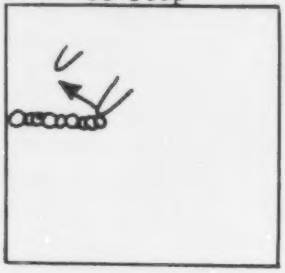
C. When arc burns brightly, move to edge maintaining the correct arc length and begin forming the puddle

D. Move across metal two inches

E. To stop bead, move electrode back through the puddle and lift up (Figure 3)

FIGURE 3

To Stop

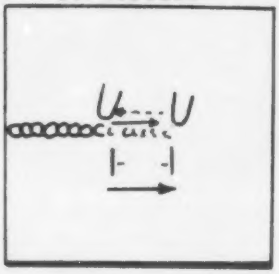


(NOTE: This will prevent cracks from forming in the puddle.)

F. To restart, strike arc about 1" in front of crater (Figure 4)

FIGURE 4

To Restart



G. Move back through the crater when arc burns brightly and then resume the bead

(NOTE: This is necessary in order for beads to blend with one another without a change in continuity.)

ARC WELDING
UNIT II

JOB SHEET #2--CONSTRUCT A PAD

I. Equipment, tools, and material needed

   A. Piece of metal 1/4" to 3/8" thick, 4" x 4"

   B. Welder

   C. Electrode holder and lead

   D. Ground clamp and lead

   E. Helmet

   F. Gloves

   G. Electrodes

   H. Safety goggles

   I. Chipping hammer

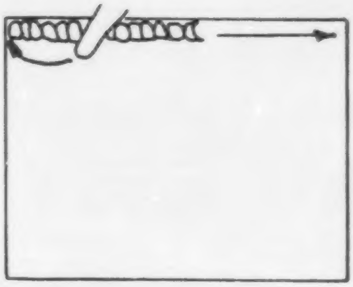
   J. Wire brush

II. Procedure

   A. Prepare metal for welding

   B. Strike arc and move to point to begin pad (Figure 1)

FIGURE 1



   C. Lay a straight bead across the plate using a weaving motion

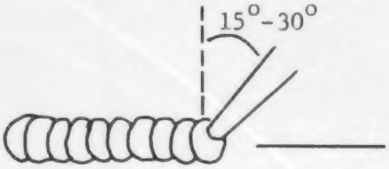
(NOTE: In using E6011 electrode, it is necessary to use some type of rod manipulation in running a bead.)

JOB SHEET #2

D. Hold electrode at a 15° to 30° angle in direction of travel and lower electrode as rod burns away to maintain correct arc length (Figure 2)

(NOTE: There should be 90° on each side of the electrode.)

FIGURE 2

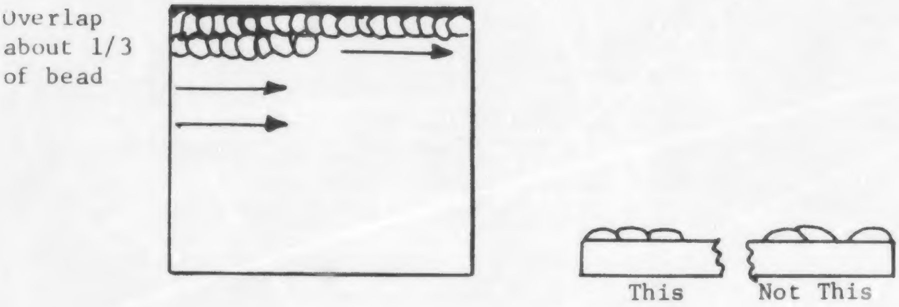


E. Move electrode steadily from right to left across pad

F. Clean the slag from each bead before starting the next one

G. Run beads until pad is full overlapping each bead (Figure 3)

FIGURE 3



H. Let each bead cool until slag is black before chipping

I. Run additional layers until desired thickness is obtained

ARC WELDING
UNIT II

JOB SHEET #3--CONSTRUCT A BUTT WELD

I. Equipment, tools, and materials needed

A. Two pieces of metal, 1/4" to 3/8" thick, 3" x 6"

B. Welder

C. Electrode holder with leads

D. Ground clamp with leads

E. Helmet

F. Gloves

G. Electrodes

H. Safety goggles

I. Chipping hammer

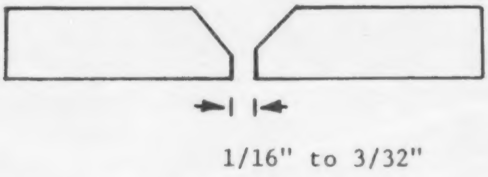
J. Wire brush

II. Procedure

A. Prepare metal to be welded (Figure 1)

(NOTE: If metal thickness is over 1/8", then the edges should be beveled.)

FIGURE 1



Bevel Edges

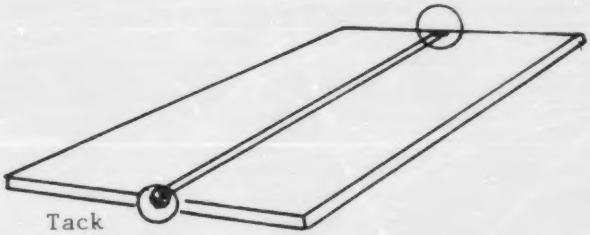
B. Place two pieces of metal parallel to each other

(NOTE: Leave a space from 1/16" to 3/32" between them.)

JOB SHEET #3

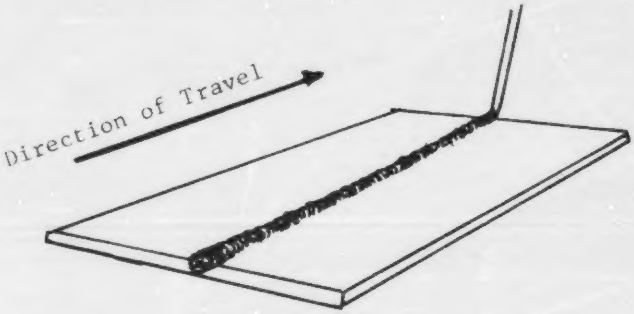
C. Tack weld pieces together at both ends (Figure 2)

FIGURE 2



D. Complete weld using a single pass (Figure 3)

FIGURE 3


Direction of Travel

E. Chip slag and brush weld

ARC WELDING
UNIT II

TEST

1. Match terms on the right to the correct definition.

_____a. Metal to be welded

_____b. Weld between two metal parts on the same plane

_____c. Joining of two or more pieces of metal together by the fusion process

_____d. Flow of current across a narrow gap

_____e. Made by one pass of the electrode

_____f. Type of edge preparation

_____g. Depression at the end of the weld

_____h. Metal rod which conducts a current from the electrode holder to the base metal

_____i. American Welding Society

1. Arc
2. Base metal
3. Bead weld
4. Bevel
5. Butt joint
6. Crater
7. Electrode
8. Welding
9. A.W.S.

2. List five safety precautions used in arc welding.

a.

b.

c.

d.

e.

3. List two kinds of arc welders.

a.

b.

4. Select from the following list common equipment used in arc welding by placing as "X" in the blank.

_____a. Welder

_____b. Torch

_____c. Table

_____d. Shield or helmet

_____e. Gloves

_____f. Ground clamp with lead

_____g. Tape

_____h. Wire brush

_____i. Electrode

_____j. Base metal

5. List four types of electrodes.

a.

b.

c.

d.

6. Place an "X" by the two most common sizes of electrode used in agricultural mechanics program.

_____a. 1/4"

_____b. 1/8"

_____c. 1/16"

_____d. 5/32"

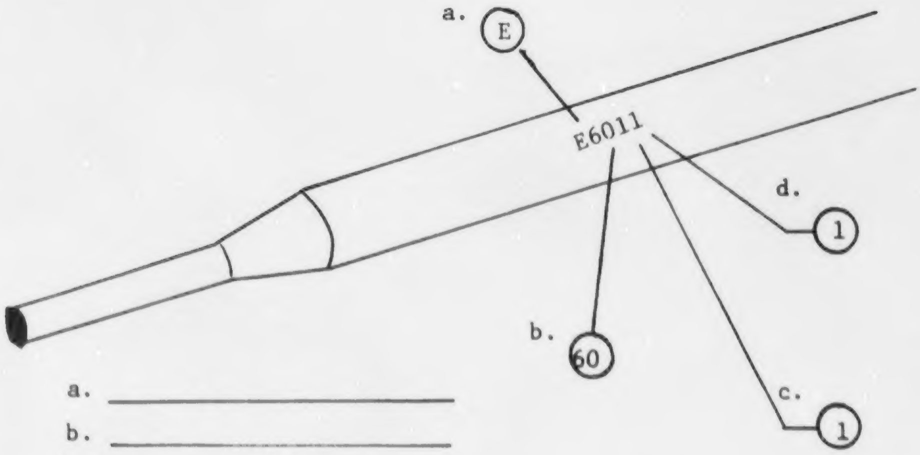
_____e. 3/8"

_____f. 3/32"

_____g. 3/16"

_____h. 3/64"

7. Identify the meaning of the numbers in the electrode classification system from the drawing.



a. ______________________

b. ______________________

c. ______________________

d. ______________________

8. Name two methods of coating electrodes.

   a.

   b.

9. List three purposes of electrode coating.

   a.

   b.

   c.

10. Describe the effect of raising and lowering the arc welding current.

11. Name two methods of establishing an arc.

   a.

   b.

12. Select from the list below characteristics of the proper arc length by placing an "X" in the blank by the proper statements.

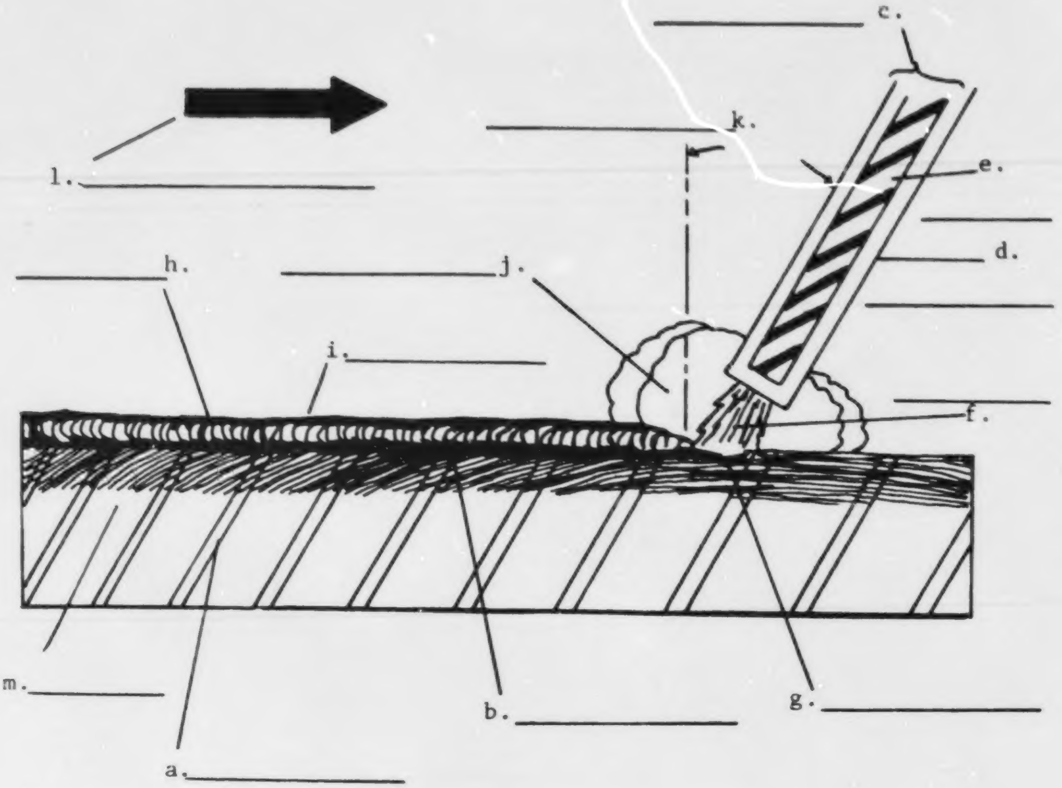
_____a. Arc length is always 1/2" long

_____b. Arc length is the same as the length of the electrode

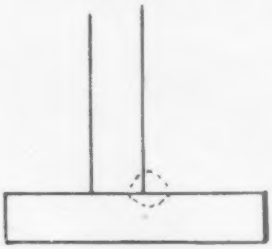
_____c. End of electrode is the same distance from the base metal as the diameter of the electrode

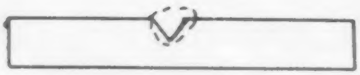
_____d. Correct arc length makes a steady hum of the welder and a "frying" sound at the arc

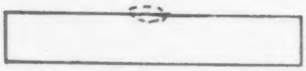
13. Label the parts of the drawing associated with the welding process.



14. Identify the following welds.

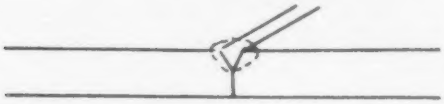




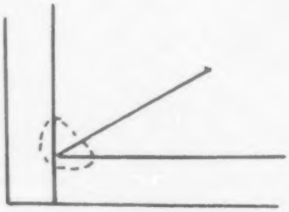


a. ____________________ b. ____________________ c. ____________________

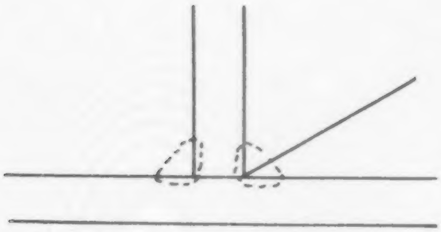
15. Identify five types of weld joints.



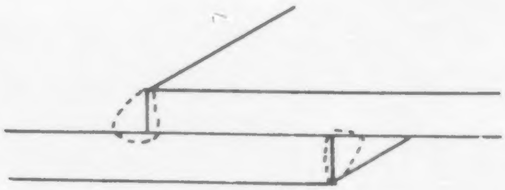
a. ____________________



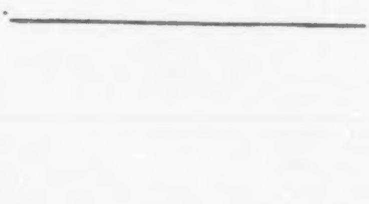
b. ____________________



c. ____________________



d. ____________________



e. ____________________

16. List four welding positions.

    a.

    b.

    c.

    d.

17. List four reasons for poor welds.

    a.

    b.

    c.

    d.

18. Name the five essentials for a proper welding procedure.

    a.

    b.

    c.

    d.

    e.

19. Demonstrate the ability to:

    a. Start, stop, and restart a bead.

    b. Construct a pad weld.

    c. Construct a butt weld.

    (NOTE: If these have not been completed before the test, ask the instructor when the above activities should be completed.)

ARC WELDING
UNIT II

ANSWERS TO TEST

1. a. 2

   b. 5

   c. 8

   d. 1

   e. 3

   f. 4

   g. 6

   h. 7

   i. 9

2. Any five of the following

   a. Never look at arc with the naked eye.

   b. Use a head or face shield that is in good condition.

   c. Wear suitable clothing to protect all parts of the body.

   d. Do not strike an arc or weld until you are sure those in the vicinity have protective equipment or will look in the other direction.

   e. Do not weld around combustible or flammable materials.

   f. Do not pick up hot metal.

   f. Do not weld in confined places without ventilation.

   h. Always open main switch or disconnect plug when checking over a welder.

   i. Do not leave electrode holder on welding table or in contact with grounded metal surface.

   j. Do not use worn or frayed cables.

   k. Stand on dry footing when welding.

   l. Keep area around welder clean.

   m. Keep tools and metals in their proper locations.

3. Any two of the following
   a. A.C.
   b. D.C.
   c. TIG
   d. MIG
4. a,d,e,f,h,i
5. a. Mild steel
   b. High carbon steel
   c. Hard surfacing
   d. Alloys--Special purpose
6. b,d
7. a. Arc welding electrode
   b. Tensile strength
   c. Welding position
   d. Special characteristics
8. Any two of the following
   a. Wrapping
   b. Dipping
   c. Extruding
9. Any three of the following
   a. Stabilizes arc
   b. Shields molten puddle from air
   c. Floats impurities out of puddle
   d. Forms slag and slows cooling
   e. Increases speed and improves quality of weld

10. Description should include:
    - a. Raising current--Produces more heat
    - b. Lowering current--Produces less heat
11. a. Scratching
    - b. Tapping
12. c,d
13. a. Base metal
    - b. Penetration
    - c. Electrode
    - d. Coating (flux)
    - e. Wire core
    - f. Arc
    - g. Crater
    - h. Slag
    - i. Weld
    - j. Gaseous shield
    - k. 15° - 30°
    - l. Direction of travel
    - m. Heat lines
14. a. Fillet
    - b. Groove
    - c. Bead
15. a. Butt
    - b. Corner
    - c. T
    - d. Lap
    - e. Edge

16. a. Flat
    b. Vertical
    c. Overhead
    d. Horizontal

17. Any four of the following
    a. Machine adjustment too hot or too cool
    b. Electrode size too large or too small
    c. Improper movement of electrode
    d. Improper angle of holding electrode
    e. Improper base metal preparation
    f. Arc length too short or too long

18. a. Select the propler electrode - size and type
    b. Select the correct amperage
    c. Use correct travel speed
    d. Position the electrode correctly
    e. Use proper joint preparation and positioning

19. Performance skills will be evaluated to the satisfaction of the instructor.

METAL WORK
UNIT III

TERMINAL OBJECTIVES

After completion of Unit III, the student should be able to measure, mark, cut, and bend metal properly and to drill holes in metal. This will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. List four reasons for marking metal.
2. Identify common devices used in marking and measuring metal.
3. List three tools used for cutting cold metal.
4. Match the cold chisel with its use.
5. List the steps used in bending metal.
6. Demonstrate the ability to:
    a. Cut flat plate metal with a cold chisel.
    b. Drill holes with a drill press.

METAL WORK
UNIT III

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information and job sheets
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information sheet
6. Demonstrate and discuss procedures outlined in job sheets
7. Give test

Student:

1. Read objectives
2. Study information sheet and take notes
3. Demonstrate the ability to accomplish the procedures outlined in the job sheets
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objective sheets
2. Information sheet
3. Transparency masters
    - TM 1--Devices Used in Marking Metal
    - TM 2--Devices Used in Measuring Metal
    - TM 3--Devices Used in Both Measuring and Marking Metal
    - TM 4--Cold Chisels
    - TM 5--Bending and Shaping Metal
    - TM 6--Making an Eye With Pipe and Vise
4. Job sheets
    - #1--Cut Flat Metal wigh a Cold Chisel
    - #2--Drill Holes with a Drill Press
5. Test
6. Answers to test

References:

1. Jones, M.M. Shopwork on the Farm. New York: McGraw-Hill Book Co., 1955.

2. Ross, Henry and R.N. Craig. *Modern Farm Shop*. Austin, Texas; Streck Publishing Co., 1954.

3. Phipps, Lloyd J. *Mechanics in Agriculture*. Danville, Illinois: Interstate Printers and Publishers, Inc., 1967.

4. Wakeman, T.J. and Vernon L. McCoy. *The Farm Shop*. New York: the Macmillan Co., 1960.

5. *Instructional Materials for Vocational Agriculture I*. College Station, Texas: Teaching Materials Center, Agriculture Education Department, Texas A & M University.

6. Walker, John R. *Modern Metalworking*. Homewood, Illinois: Goodheart-Willcox Co., 1965.

METAL WORK
UNIT III

INFORMATION SHEET

I. Reasons for marking metal

   A. Cut

   B. Drill

   C. Bend

   D. Weld

II. Common devices used in marking and measuring metal (Transparencies 1,2, and 3)

   A. Marking

      1. Combination square

      2. Scratch awl

      3. Scriber

      4. Center punch

      5. Chalk or soapstone

      6. Flat file

      7. Compass

   B. Measuring

      1. Steel rule

      2. Framing square

      3. Try square

      4. Combination square

      5. Steel tape

      6. Micrometer

         (NOTE: The micrometer is used when a high degree of accuracy is necessary.)

INFORMATION SHEET

7. Calipers

8. Dividers

III. Tools used for cutting cold metal

A. Hacksaw

B. Bolt cutter

C. Cold chisel

D. Tinner's snips

E. Metal shears

F. Metal band saw

IV. Cold chisels and their uses (Transparency 4)

A. Standard flat (Most common)--Used to cut sheet metal, bolts, nuts, rivets, and rods

B. Diamond point--Used for cutting triangle grooves or for marking square corners in grooves

C. Cape--Used to cut out rectangle grooves or channels

D. Round nose--Used for cutting oval grooves or channels

V. Steps in bending metal (Transparencies 5 and 6)

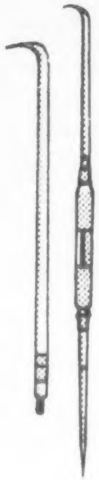
A. Mark the point

B. Place the metal in a vise or on the anvil

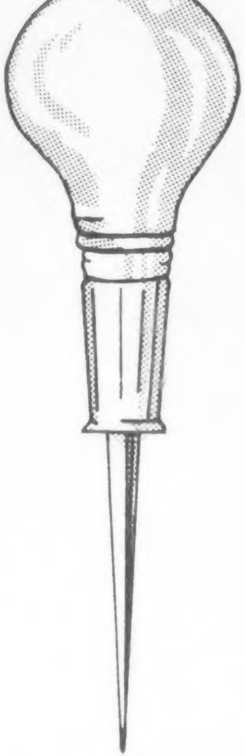
C. Bend metal with a hammer

D. Bend metal at the top of the vise or at the top of the anvil

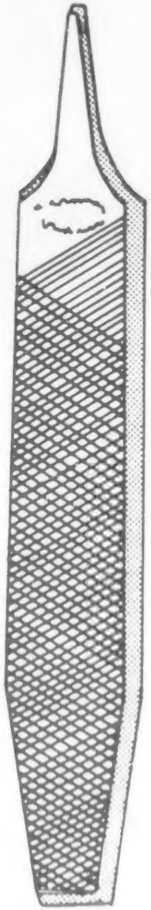
Devices Used in Marking Metal



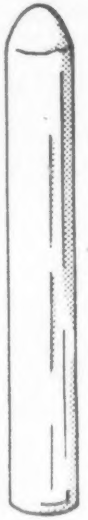
Scriber



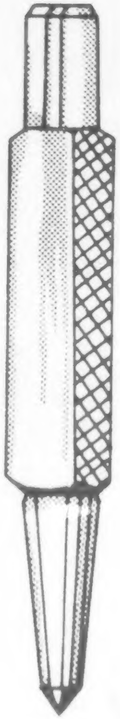
Scratch Awl



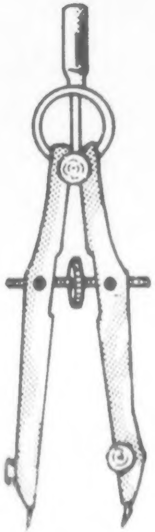
Flat File



Soapstone or Chalk

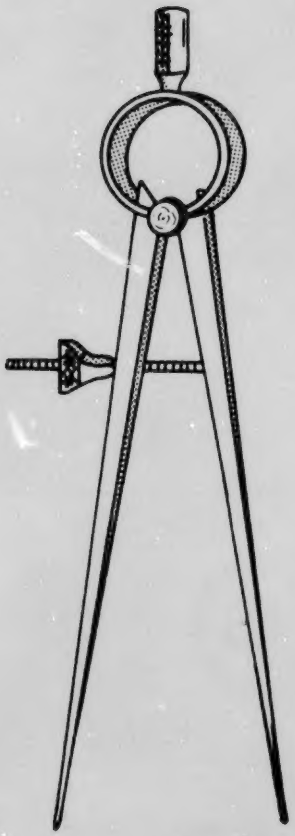


Punch

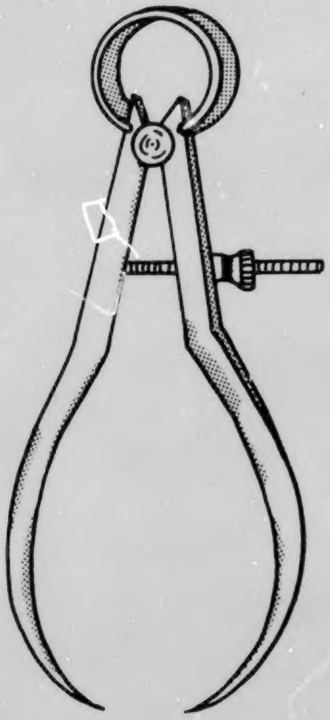


Compass

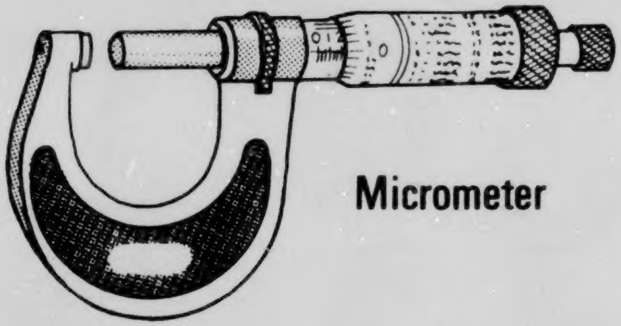
Devices Used in Measuring Metal



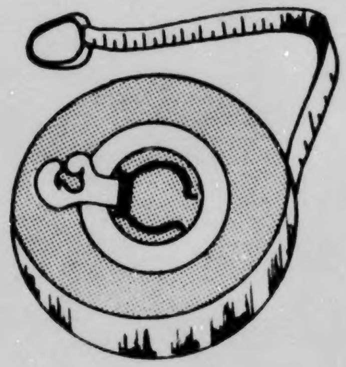
Dividers



Calipers-Outside

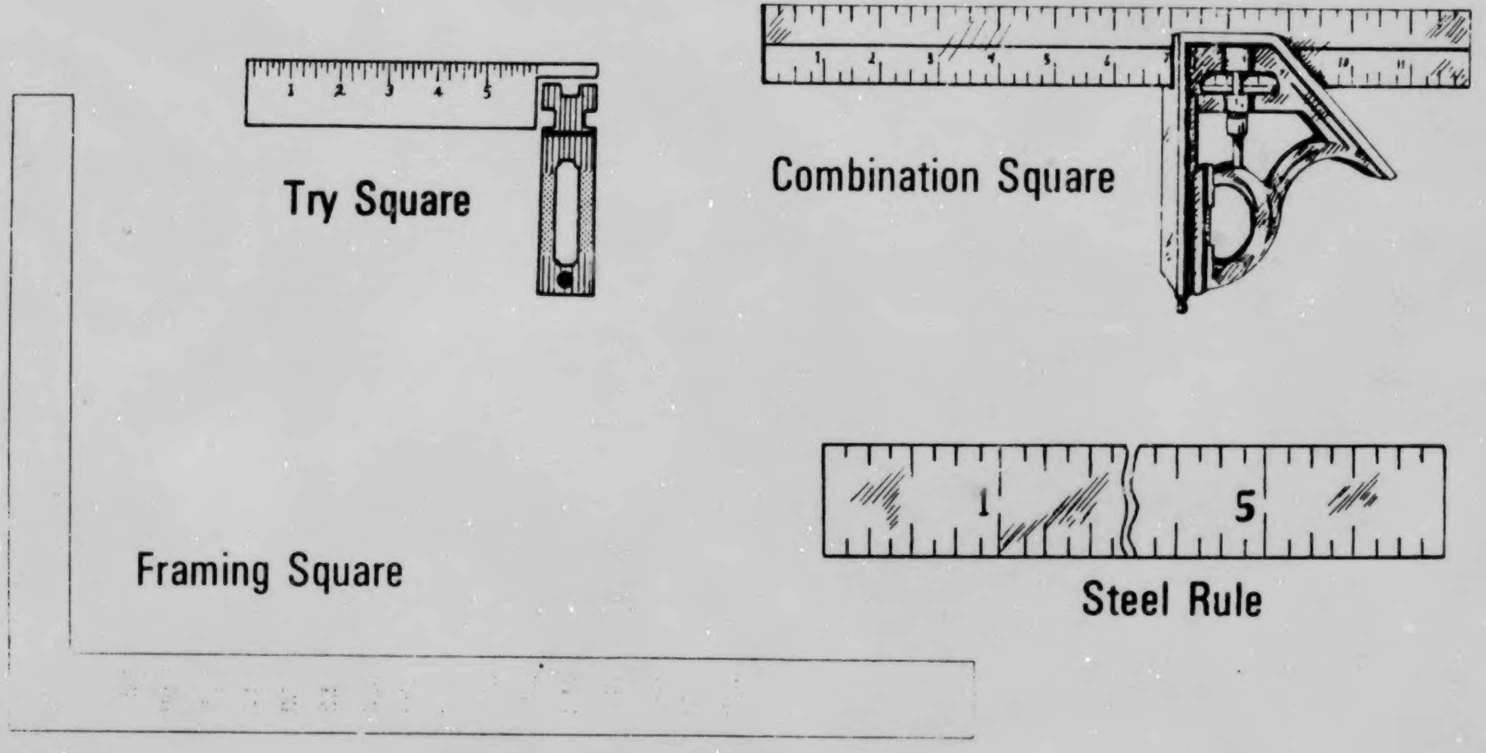


Micrometer



Steel Tape

Devices Used in Both Measuring and Marking Metal


1 2 3 4 5
1 2 3 4 5 6 7 10 11
1
5

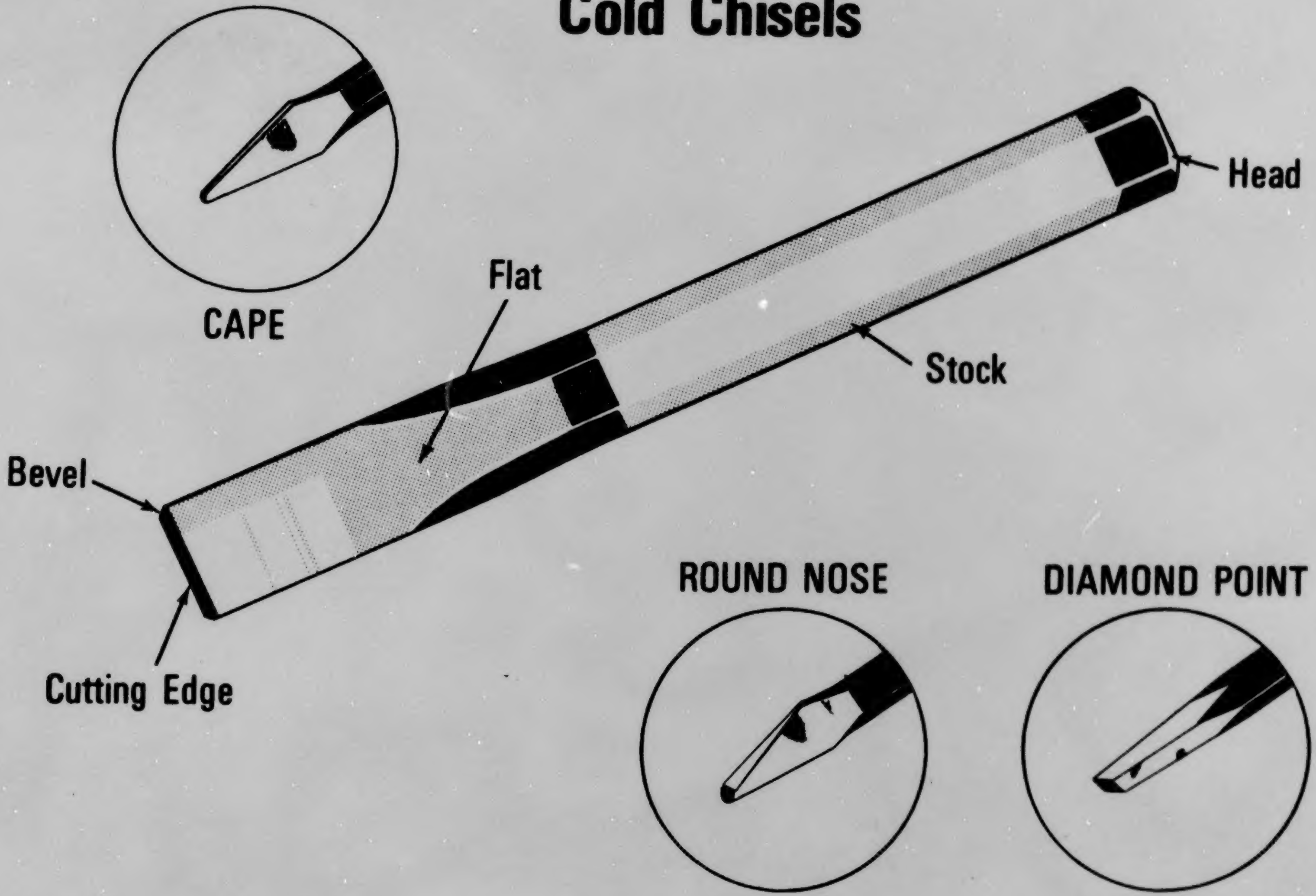
Try Square

Combination Square

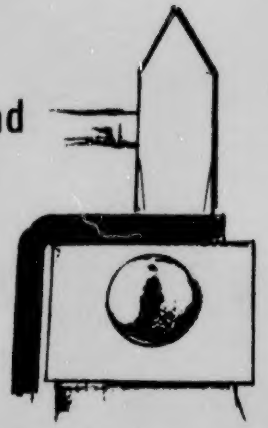
Framing Square

Steel Rule

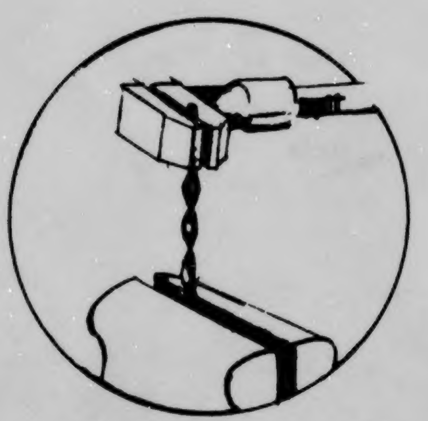
Cold Chisels


CAPE
Flat
Head
Stock
Bevel
Cutting Edge
ROUND NOSE
DIAMOND POINT

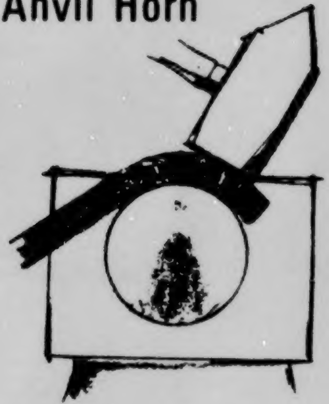
Bending and Shaping Metal



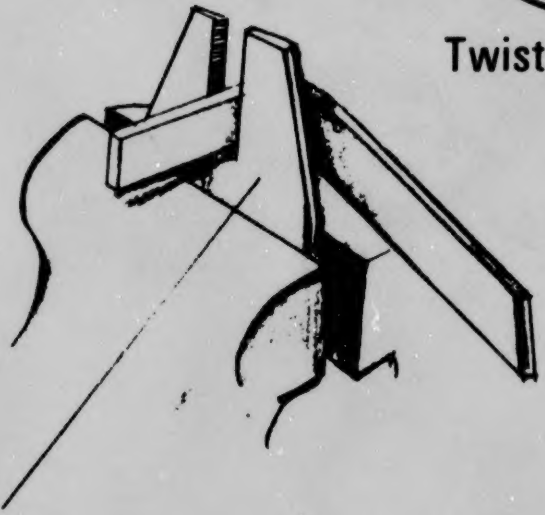
90° Bend on Anvil



Twisting Square Rod

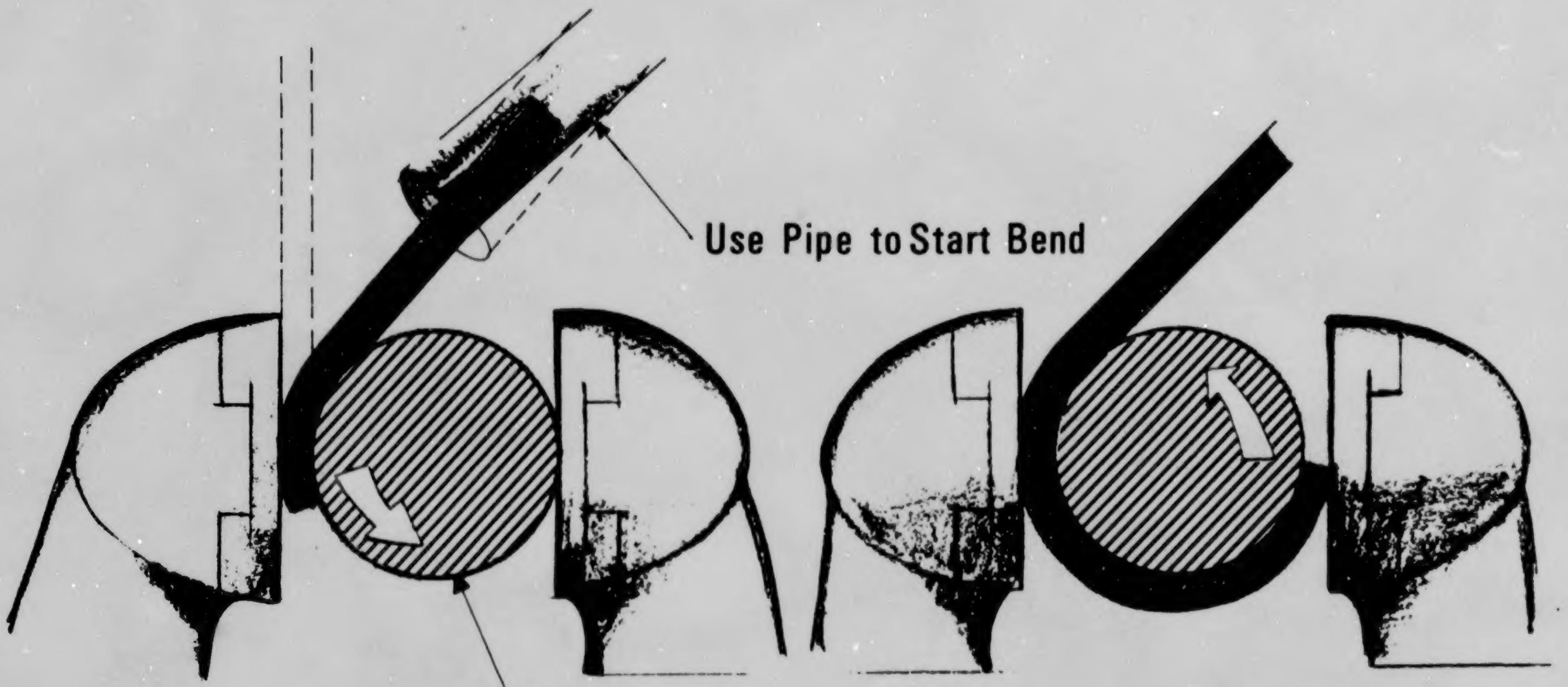


Shape End on Anvil Horn



Use Metal Bending Forks

Making an Eye With Pipe and Vise


Use Pipe to Start Bend
Rod

METAL WORK
UNIT III

JOB SHEET #1--CUT FLAT METAL WITH A COLD CHISEL

I. Tools and equipment needed

  A. Marker (such as oval or chalk)

  B. Flat strip of metal

  C. Chisel

  D. Hammer

  E. Vise

  F. Safety goggles

II. Procedure

  A. Mark the metal

  B. Place the metal in the vise with the cutting mark just above the jaws of the vise

  C. Select proper size chisel and hammer

  (NOTE: For larger size metal, use a larger chisel and hammer.)

  D. Place the chisel at side of the metal to start the shearing point and drive the chisel with a hammer

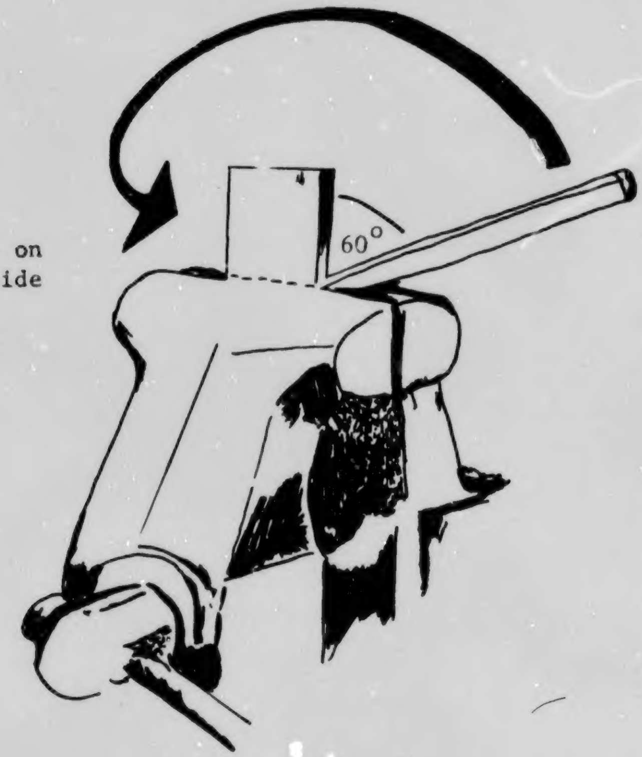
  E. Hold the chisel at approximately a 60° angle

  F. Make cuts from each end of the metal to the center and on both sides

  G. Bend metal back and forth until it breaks

JOB SHEET #1

III. Diagram of the procedure



Repeat Cut on
Opposite Side

METAL WORK
UNIT III

JOB SHEET #2--DRILL HOLES WITH A DRILL PRESS

I. Tools and equipment needed

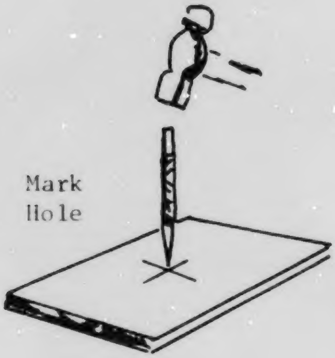
- A. Small piece of flat metal
- B. Center punch
- C. Hammer
- D. Wooden block
- E. Cutting oil
- F. Clamp
- G. Safety goggles

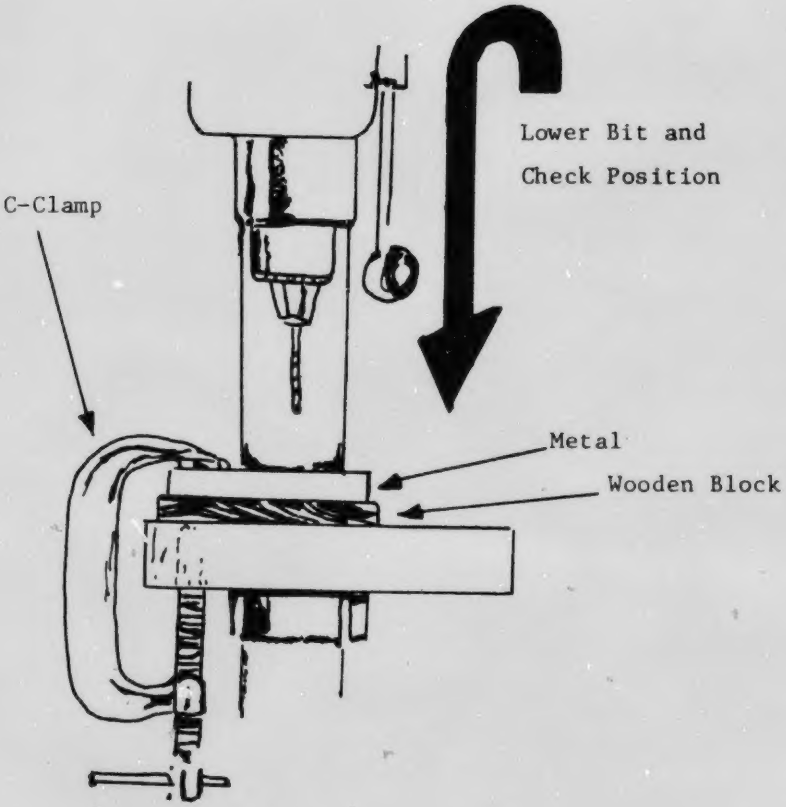
II. Procedure

- A. Mark the hole with a center punch
- B. Place the metal on a wooden block
- C. Clamp the metal being drilled securely to prevent it from spinning
- D. Feed the bit down to the metal and start drilling
- E. Raise the bit to see if you are drilling in the proper place
- F. Using cutting oil on the drill bit two or three inches above the work, continue drilling

JOB SHEET #2

III. Diagram of the procedure




Lower Bit and
Check Position
C-Clamp
Metal
Wooden Block

METAL WORK
UNIT III

TEST

1. List four reasons for marking metal.

   a.

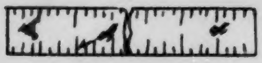
   b.

   c.

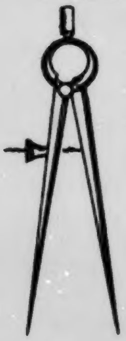
   d.

2. Identify the following common devices used in marking and measuring metal.

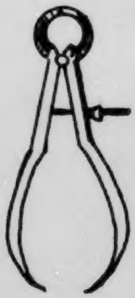
a. ____________



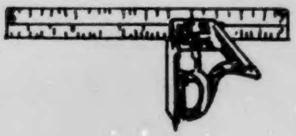
b. ____________



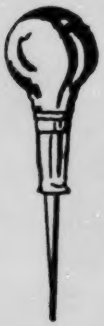
c. ____________



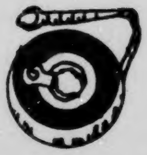
d. ____________



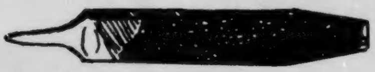
f. ____________



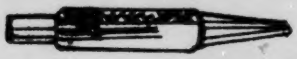
e. ____________



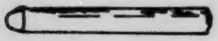
g. ____________



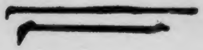
h. ____________



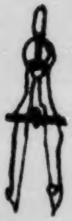
i. ____________



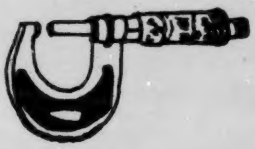
j. ____________



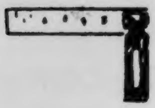
k. ____________



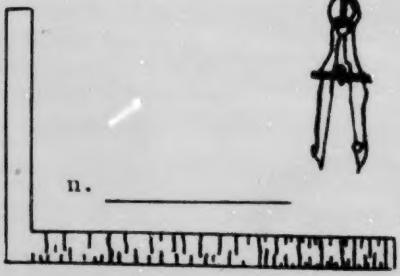
l. ____________



m. ____________



n. ____________



3. List three tools used for cutting cold metal.

   a.

   b.

   c.

4. Match the uses on the right with the appropriate chisel on the left.

   _____a. Diamond point

   _____b. Cape

   _____c. Standard flat

   _____d. Round nose

   1. Cuts triangle grooves

   2. Cuts long grooves

   3. Cuts oval grooves

   4. Cuts narrow grooves

   5. Cuts rectangle grooves

   6. Cuts sheet metal, bolts nuts, rivets, and rods

5. List the steps used in bending metal.

   a.

   b.

   c.

   d.

6. Demonstrate the ability to:

   a. Cut flat plate metal with a cold chisel.

   b. Drill holes with a drill press.

METAL WORK
UNIT III

ANSWERS TO TEST

1. a. Cut
    b. Drill
    c. Bend
    d. Weld
2. a. Steel rule
    b. Dividers
    c. Calipers
    d. Combination square
    e. Steel tape
    f. Scratch awl
    g. Flat file
    h. Center punch
    i. Chalk or soapstone
    j. Scriber
    k. Compass
    l. Micrometer
    m. Try square
    n. Framing square
3. Any three of the following
    a. Hacksaw
    b. Bolt cutter
    c. Cold chisel
    d. Tinner's snips
    e. Metal shears
    f. Metal band saw
4. a. 1
    b. 5
    c. 6
    d. 3

5. a. Mark the point
   b. Place the metal in a vise or on the anvil
   c. Bend metal with a hammer
   d. Bend metal at the top of the vise or at the top of the anvil
6. Performance skills will be evaluated to the satisfaction of the instructor.

THE TWIST DRILL
UNIT IV

TERMINAL OBJECTIVES

After completion of Unit IV, the student should be able to identify, select, and sharpen a twist drill. He should be able to select the proper cutting oil to use for different jobs. This will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Identify the parts of a twist drill.
2. Match the degree of angle to the desired parts of the twist drill.
3. Match the common jobs to the correct cutting oils.
4. Name the four systems used for twist drill size designation.
5. Demonstrate the ability to sharpen a twist drill bit.

THE TWIST DRILL
UNIT IV

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objectives
2. Provide students with information and job sheets
3. Make transparencies
4. Discuss terminal & specific objectives
5. Discuss information sheet
6. Demonstrate and discuss procedures outlined in job sheets
7. Give test

Student:

1. Read objectives
2. Study information sheet and take notes
3. Demonstrate the ability to accomplish the procedures outlined in the job sheets
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objective sheets
2. Information sheets
3. Transparency masters
    - TM 1--The Twist Drill Bit
    - TM 2--Angles on the Twist Drill Bit
4. Job sheet
    - #1 Sharpening the Twist Drill
5. Test
6. Answers to test

References

1. Wakeman, T.J. and McCoy, V.E., The Farm Shop, The MacMillian Co., New York, New York.

2. Phipps, Lloyd J., Mechanics in Agriculture, Interstate Printers and Publishers, Danville, Illinois.

THE TWIST DRILL
UNIT IV

INFORMATION SHEET

I. Twist Drill Definition

   A. Twist drill is an end cutting tool having cutting edges sharpened to form angles with the axis of the drill. Twist drills are used to cut circular holes. The cutting angles are varied depending on the material to be cut (wood, soft metal, hard metal). Spiral grooves are formed in the drill bit to remove the metal cuttings. Twist drills are made of carbon tool steel or high speed steel.

II. Parts of the Twist Drill (Transparency 1)

   A. The drill has three general parts - the shank, the body, and the point

   B. Shanks - the portion held by the drill chuck

      1. Straight shank
      2. Taper shank
      3. Blacksmiths shank
      4. Bit stock shank

   C. The body consists of the following parts:

      1. Flutes - grooves which remove cuttings
      2. Margin - area left after under cutting of body - reducing frictional contact
      3. Body Clearance - the under cut area between margins and flutes
      4. Web - the thin partition in the center of the drill - between flutes

INFORMATION SHEET

D. The Point - the entire cone shaped end of the drill which forms the cutting end. It contains the following parts:

1. Dead Center - the chisel shaped portion of the point - usually forms a 135° angle with a cutting lip

2. Lip - (cutting edges), formed by intersection of the flute and cone-shaped point, must be of equal length and angle

3. Lip Clearance - is the amount of relief ground on the point extending back from the cutting edge to the heel

F. Angles - the following angles are normal for a general purpose metal cutting twist drill (Transparency 2)

1. Included Angle - 118°, (59° + 59°)

2. Lip Clearance Angle - 12°-15°

3. Dead Center Angle - 135°

(NOTE: As material hardness increases the included angle would be increased to as much as 150°. For softer material such as wood it could be reduced to as little as 90°.

III. Cutting Oils

A. Reason for using cutting oil

1. Reduce frictional drag

2. Carry away heat

3. Carry away cuttings

4. Improve finish

5. Allow faster cutting speed

B. Four classifications of cutting oils

1. Pure lard oil

2. Mineral lard oil

3. Pure mineral oil

4. Soluble cutting compounds

INFORMATION SHEET

C. Suggested cutting oil application

  1. Steel and iron - mineral lard oil

  2. Aluminum - kerosene

  3. Cast iron and brass - dry

IV. Size Designations for Drill Bits - four systems

  A. Fractional - 1/64" to 3" by steps of 1/64"

  B. Numbers - #1 to #80 - (.228" to .0135")

  C. Letters - A to Z - (.234" to .413")

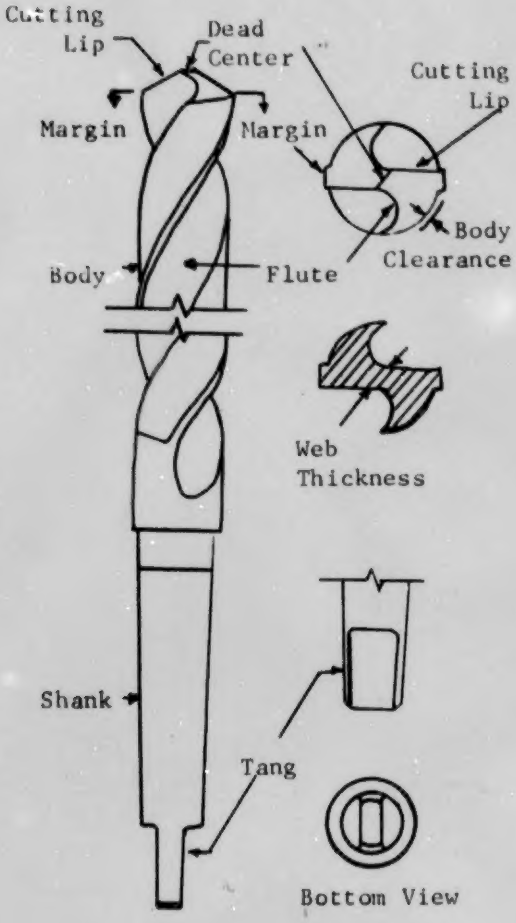
  D. Metric - 0.4mm-50mm

  E. Sizes are usually stamped on drill shank

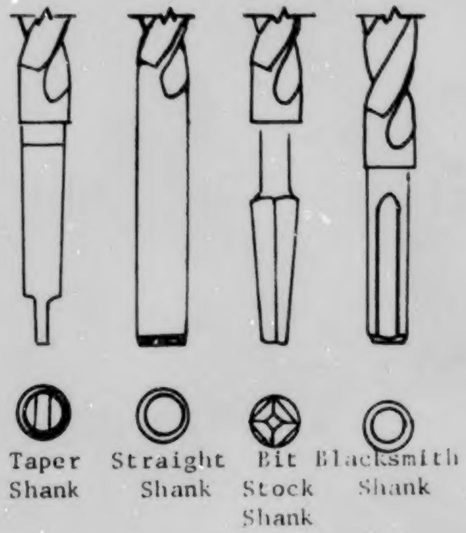
  F. Size can be measured across margins

THE TWIST DRILL BIT

Parts of a Twist Drill

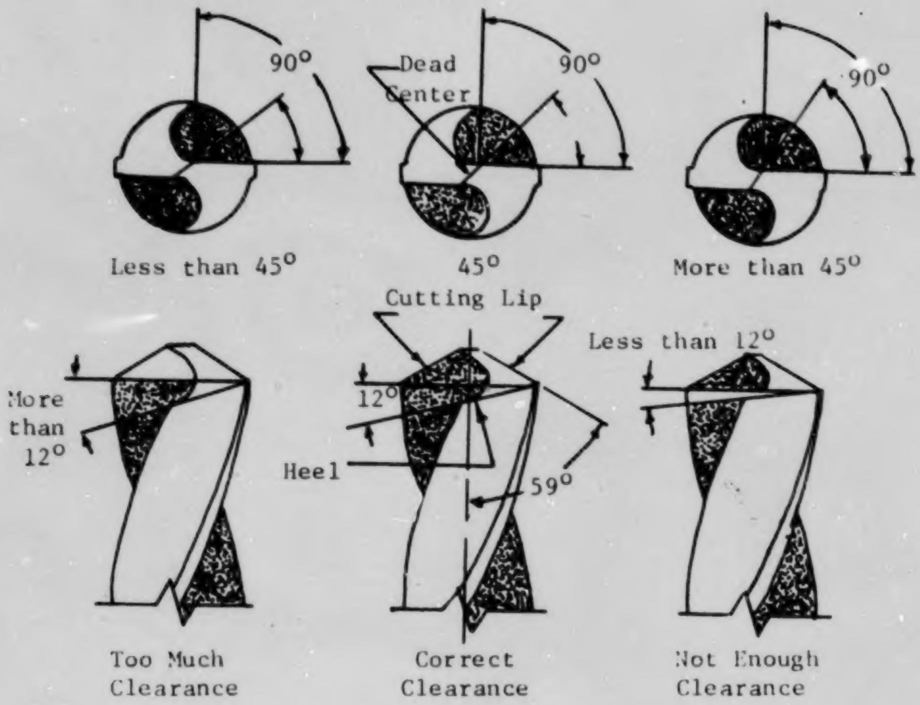

Cutting Lip
Dead Center
Cutting Lip
Margin
Margin
Body Clearance
Body
Flute
Web Thickness
Shank
Tang
Bottom View

Shapes of Twist Drill Shanks


Taper Shank
Straight Shank
Bit Stock Shank
Blacksmith Shank

500

ANGLES ON THE TWIST DRILL BIT


90°
Dead Center
90°
90°
Less than 45°
45°
More than 45°
Cutting Lip
Less than 12°
More than 12°
12°
Heel
59°
Too Much Clearance
Correct Clearance
Not Enough Clearance

THE TWIST DRILL
UNIT IV

JOB SHEET #1 - SHARPENING THE TWIST DRILL BIT

I. Tool and equipment needed

A. Bench grinder with fine grit stone

B. Goggles or face shield

C. Dull twist drill bit

D. Twist Drill Guage

E. Pan of water to cool bit

II. Procedure

A. Grinding specifications - Included Angle-118°
Dead Center Angle-135°
Lip Clearance Angle-12°

B. Hold the drill near the point with the left forefinger and thumb. Cradle the drill in the first joint of the forefinger and place the back of the finger on the tool rest. (See Fig. 1 & 3)

C. Grasp the drill shank in the right hand with the thumb on top move the point forward until one lip comes in contact with the grinding wheel. At the beginning of each stroke, by sure that cutting lip is straight across the face of the wheel. The axis of the bit should form a 59° angle with the face of the grinding wheel. (See Fig. 1)

D. When the drill comes in contact with the wheel, push the drill shank downward to the left and at the same time, rotate the drill about 1/6 of a turn to the right. (Move to the left approximately 12° during each stroke.)

E. Keep the lip length equal by grinding one and then the other, alternately. Use the guage to frequently check lip length and angle. (See Fig. 2 & 3)

(NOTE: Grinding the shorter lip will lengthen it and at the same time sharpen the longer side.)

F. Check lip clearance by placing the cutting edge against the angle portion of the guage; then rotate to the heel portion; the amount of gap indicates the amount of lip clearance.

1/4" drill should have 1/32" gap   1/2" drill should have 1/16" gap
3/4" drill should have 3/32" gap   1" drill should have 1/8" gap

JOB SHEET #1 - SHARPENING TWIST DRILL BITS

Positioning Twist Drill to Sharpen

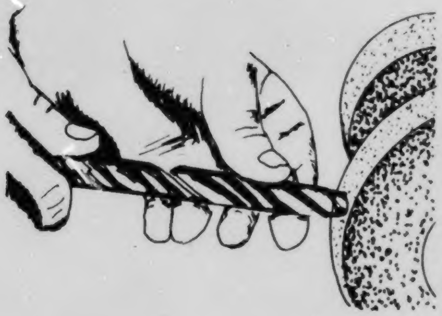


Figure 1

A--checking the shape of the point of a twist drill,
B--checking the clearance.

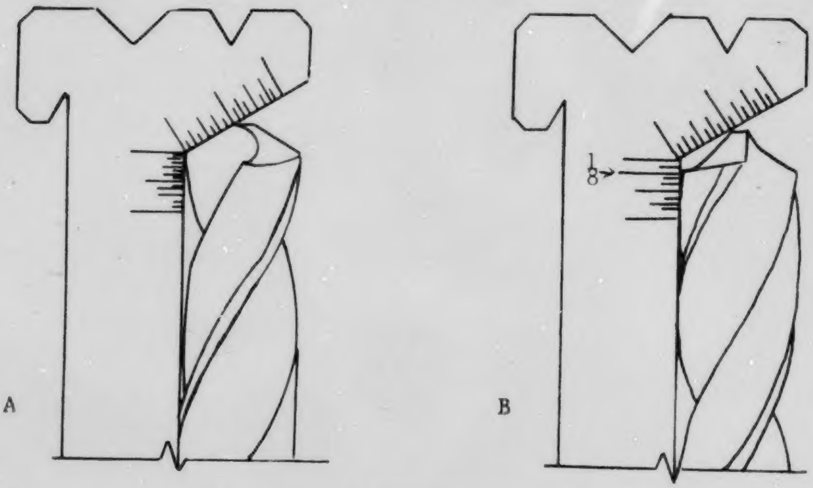
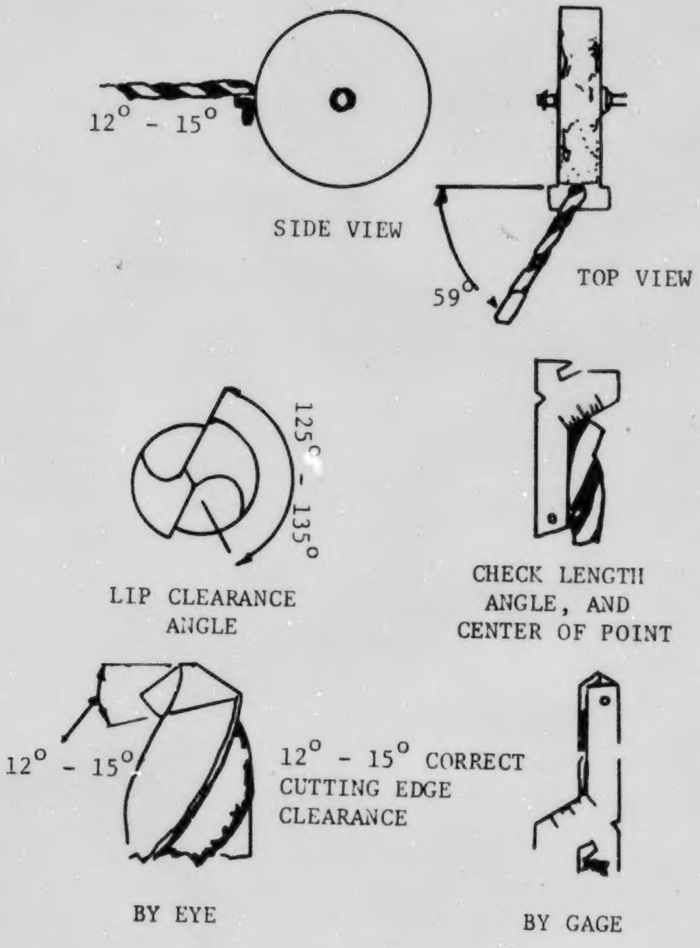


Figure 2

JOB SHEET #1 - SHARPENING TWIST DRILL BITS

FIGURE 3


12° - 15°
59°
125° - 135°
12° - 15°
12° - 15° CORRECT CUTTING EDGE CLEARANCE

SIDE VIEW

TOP VIEW

LIP CLEARANCE ANGLE

CHECK LENGTH ANGLE, AND CENTER OF POINT

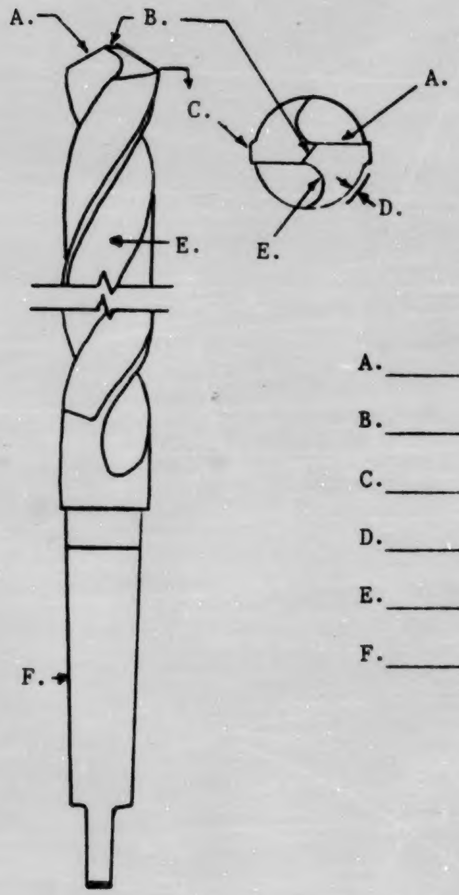
BY EYE

BY GAGE

THE TWIST DRILL
UNIT IV

TEST

1. Identify the indicated parts on the twist drill.



A. ____________________

B. ____________________

C. ____________________

D. ____________________

E. ____________________

F. ____________________

2. Match the degree of angle to the desired part.

_____a. Included angle (1) 135°

_____b. Lip clearance (2) 118°

_____c. Dead center (3) 12-15°

3. Match the job to the desired cutting oil.

_____a. Mild steel drilling (1) Kerosene

_____b. Aluminum drilling (2) Dry

_____c. Cast iron drilling (3) Soluble cutting compounds

4. Name the four systems of twist drill size designation.

a.

b.

c.

d.

5. Demonstrate the ability to sharpen a twist drill.

THE TWIST DRILL
UNIT IV

ANSWERS TO TEST

1. a. Cutting lip
   b. Dead center
   c. Margin
   d. Body clearance
   e. Flute
   f. Shank
2. a. (2)
   b. (3)
   c. (1)
3. a. (3)
   b. (1)
   c. (2)
4. a. Fractional - 1/64" to 3" by steps of 1/64"
   b. Numbers - #1 to #80 - (.228" to .0135")
   c. Letters - A to Z - (.234" to .413")
   d. Metric - 0.4mm - 50mm
5. Evaluated to the supervisors satisfaction.

TAP AND DIE THREADING
UNIT V

TERMINAL OBJECTIVES

After completion of Unit V, the student should be able to select and use a threading tap and die. This will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Identify the 3 kinds of threading taps found in a set of three taps and indicate the use of each.
2. Determine the size of a tap drill to be used for a designated stock size.
3. Identify the three kinds of dies.
4. Match the class of thread fit to the fit description.
5. Demonstrate the ability to:
    a. Thread a nut
    b. Thread a bolt

TAP AND DIE THREADING
UNIT V

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information and job sheets
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information and job sheets
6. Give test

Student:

1. Read objectives
2. Study information sheet
3. Demonstrate the ability to accomplish the procedures outlined in the job sheets
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objective sheets
2. Information sheets
3. Transparency masters
    - TM 1--Types of Taps and Order of Use
    - TM 2--Tapping
    - TM 3--Threading
4. Job sheets
    - #1--Thread a nut
    - #2--Thread a bolt
5. Test
6. Answers to test

References

1. Phipps, Lloyd J. Mechanics in Agriculture, Interstate Printers and Publishers, Inc. Danville, Illinois.

2. Wakeman, T.J. and McCoy, V.L. The Farm Shop, The MacMillan Co., New York, New York.

TAP AND DIE THREADING
UNIT V

INFORMATION SHEET

I. Hand taps are small tools used for cutting internal threads, and hand dies are small tools used for cutting external threads. These tools are made of tool steel and carefully hardened and tempered. Because of their peculiar shape and brittleness, they can be easily broken if not carefully used. Taps and dies are made in all the standard sizes and pitches.

II. Selecting Hand Taps (Transparency 1)

   A. Taps commonly come in sets of three

      1. Taper taps - only 2 or 3 threads are full size

      2. Plug taps - all threads except 3 or 4 are full size

      3. Bottoming taps - all threads except one are full size

   B. Taps are turned with a tool called a tap wrench or handle.

III. Using the Hand Tap (Transparency 2)

   A. Determining the size of hole (tap drill size) that should be drilled to tap thread in:

      1. The hole should be small enough to allow at least 75% depth of threads

      2. Formula for finding tap drill size

$$\text{Tap Drill Size} = \text{Tap Size minus } \frac{1}{\text{No. Threads/inch}}$$

   B. See Job Sheet #1 for procedure to follow when tapping thread.

IV. Selecting Hand Dies

   A. Dies commonly found:

      1. Solid - non-adjustable for thread diameter

INFORMATION SHEET

2. Split - Adjustable for thread diameter

3. Adjustable with collet and 2 dies - thread diameter may be adjusted

B. Dies are turned with a die stock

V. Using the Hand Die (Transparency 3)

A. Bevel end of rod

B. Apply oil and turn continuously

C. See Job Sheet #2 for procedure to follow when threading a bolt

VI. Classification of Common Threads

A. National Coarse - N.C. or USS

B. National Fine - N.F. or SAE

C. Metric - International Standard

D. American Standard Tapered Pipe Thread - N.P.T.

VII. Thread Fit

A. Four Classes of Fit

1. Class 1 - "Loose" - hand assemble

2. Class 2 - "Free" - hand assemble

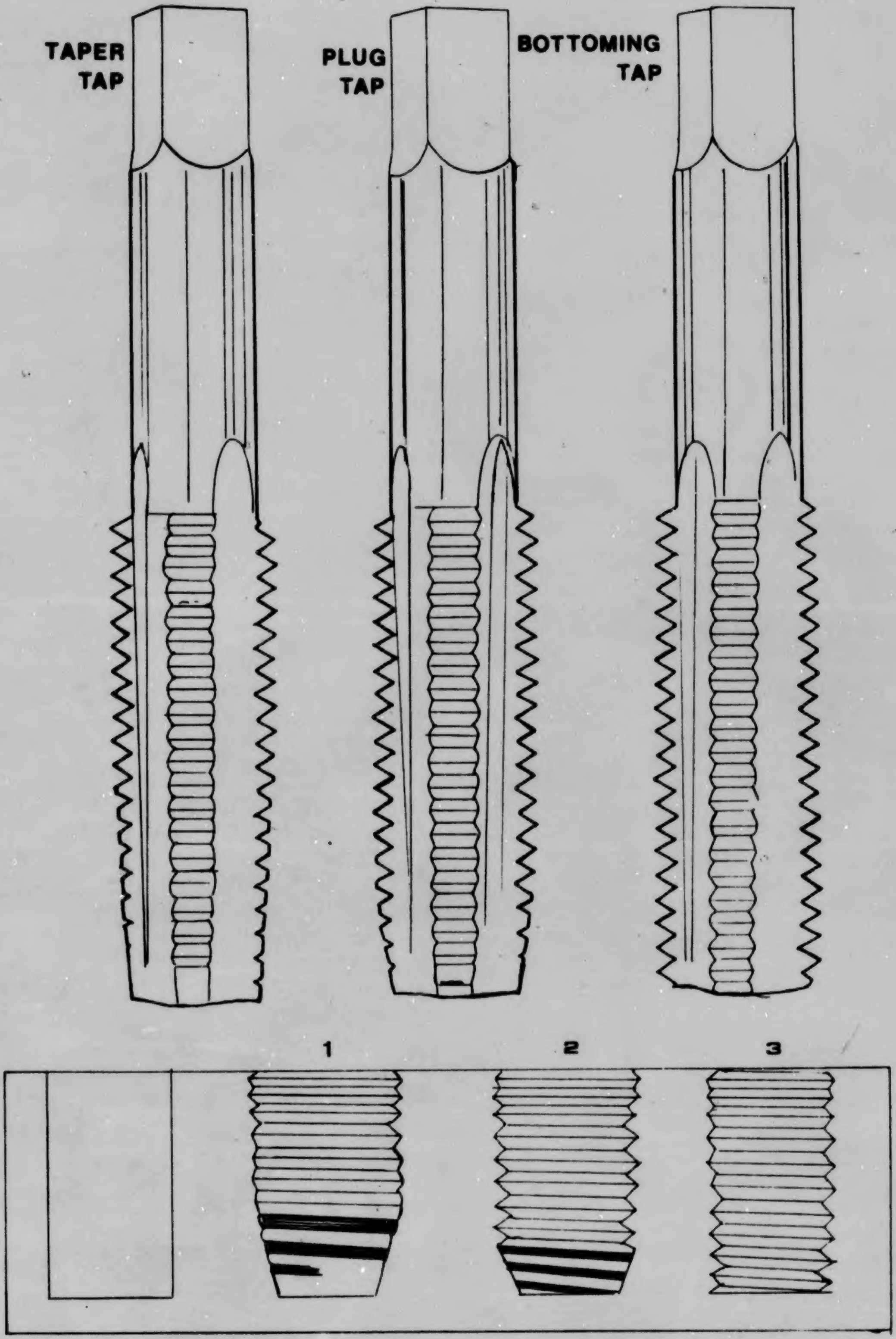
3. Class 3 - "Medium" - minimum of shake

4. Class 4 - "Close" - requires tools to assemble

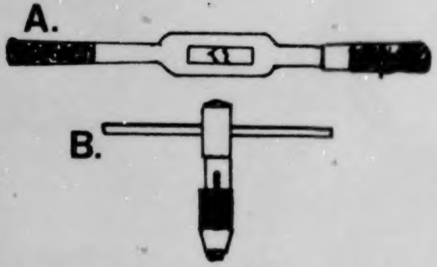
B. The thread fit is altered by using a die which can be adjusted. Start with Class 4 and close die to desired diameter of thread. (Use trial and error method)

C. Blue prints sometime indicate class of fit desired and thread type and size. (Example - 3/4 10-NC-2)

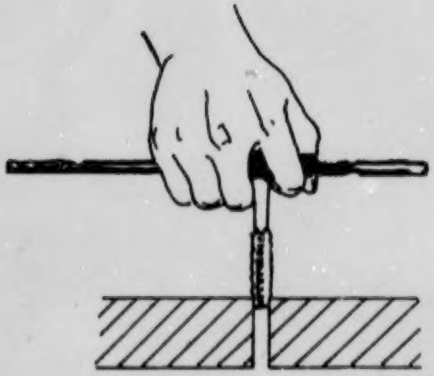
TYPES OF TAPS AND THE ORDER OF USE


TAPER TAP
PLUG TAP
BOTTOMING TAP
1
2
3

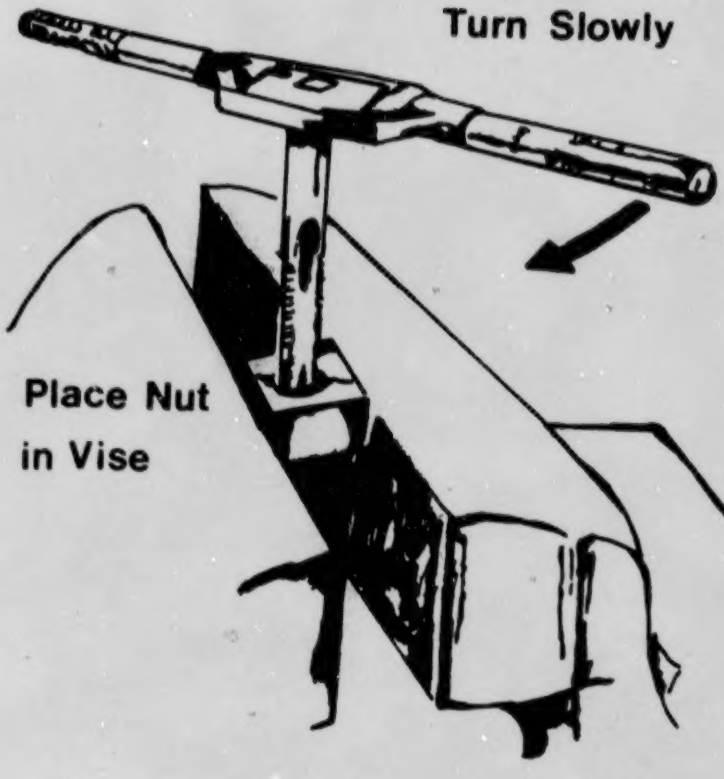
Tapping



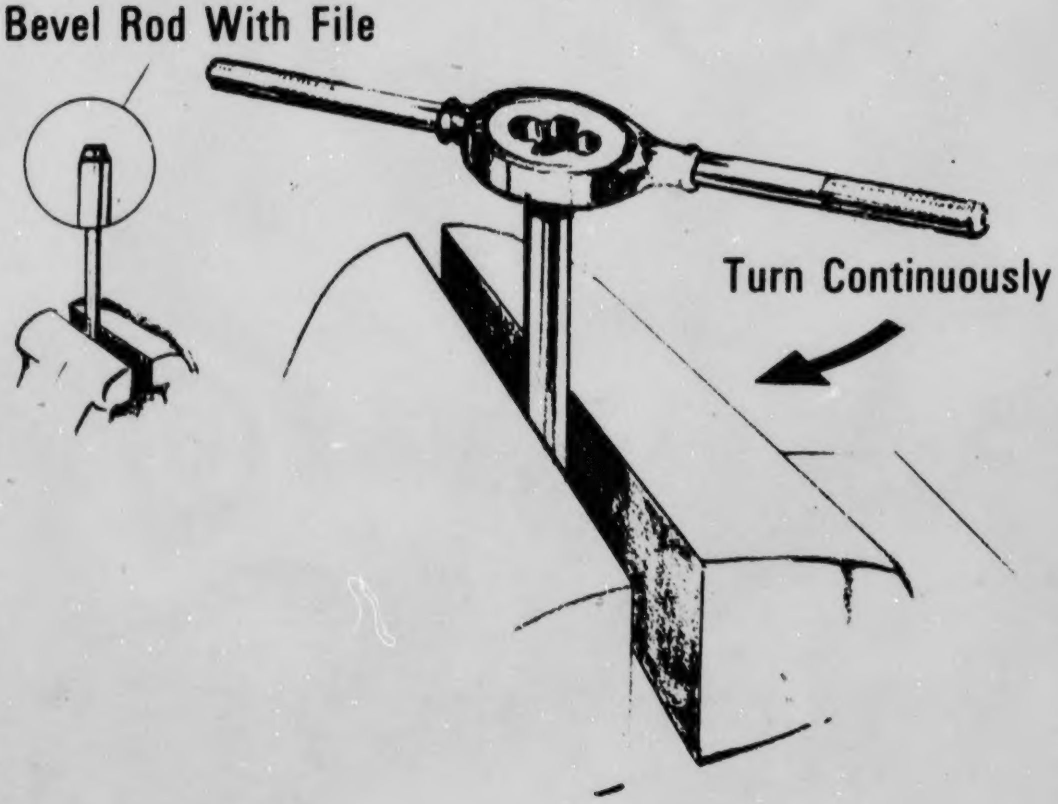
A--Adjustable tap wrench,
B--a handle chuck tap wrench.



Beginning the Tap


Turn Slowly
Place Nut
in Vise

Threading


Bevel Rod With File
Turn Continuously

TAP AND DIE THREADING
UNIT V

JOB SHEET #1 - THREAD A NUT

I. Tools and equipment needed

   A. Nut with a hole bored through it

   B. Vise

   C. Tap

   D. Cutting oil

II. Procedure

   A. Place nut in a vise firmly, but do not overtighten

   B. Select proper tap

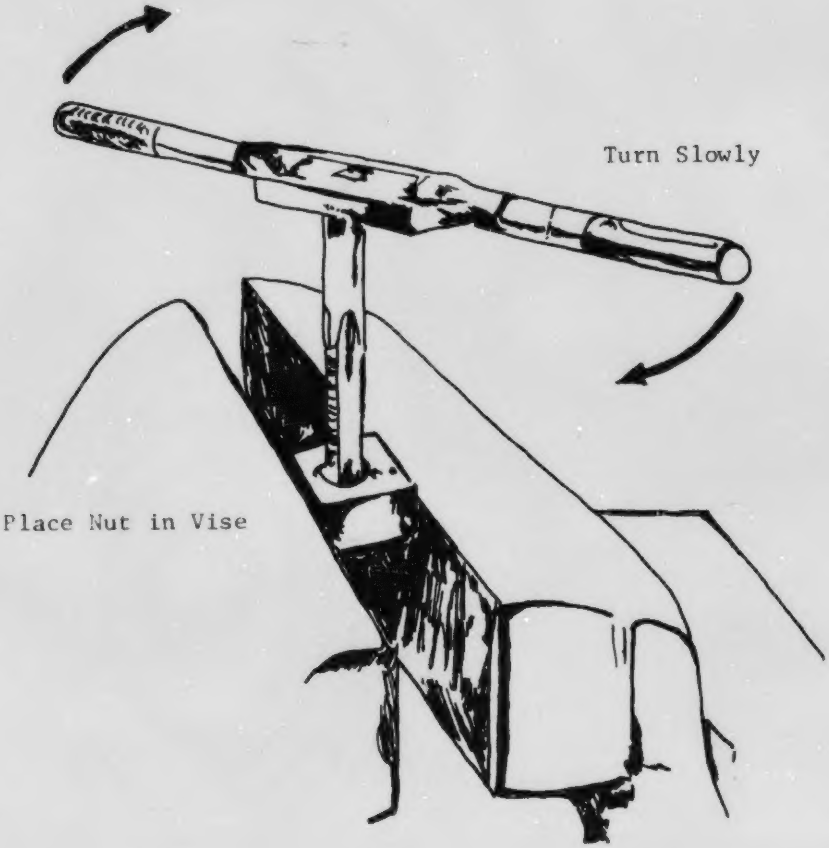
   C. Place tap in the hole of the nut and turn tap slowly

   D. Apply cutting oil

   E. Remove tap by turning to the left when threads are completed

JOB SHEET #1

III. Diagram of the procedure


Turn Slowly
Place Nut in Vise

TAP AND DIE THREADING
UNIT V

JOB SHEET #2--THREAD A BOLT

I. Tools and equipment needed

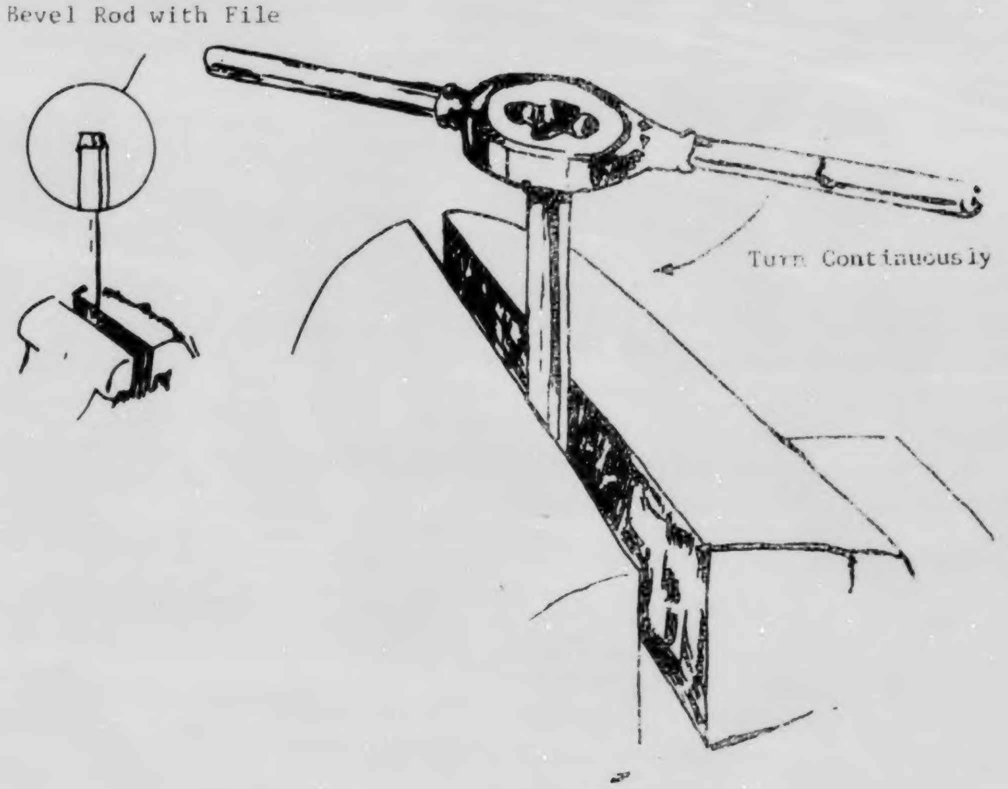
- A. Short piece of rod to be used as a bolt
- B. Flat file
- C. Die
- D. Vise
- E. Cutting oil
- F. Wire brush

II. Procedure

- A. Place rod in a perpendicular position in the vise
- B. Bevel the end to be threaded
- C. Select proper size of die and handle
- D. Place the die squarely on the bolt
- E. Apply cutting oil
- F. Turn continuously in one direction until finished
- G. Remove the die by turning it to the left

JOB SHEET #2

III. Diagram of the procedure


Bevel Rod with File
Turn Continuously

TAP AND DIE THREADING
UNIT V

TEST

1. Identify the 3 kinds of threading taps found in a set and indicate the use of each.

   a.

   b.

   c.

2. What tap drill size should be used for a 3/8" NC thread with 16 threads per inch. Show work on how you determined your answer.

3. Identify the 3 dies shown as to type. (Instructor will provide these)

4. Match the classes of thread fit to its correct description.

_____a. Class 1	1. Close
_____b. Class 2	2. Loose
_____c. Class 3	3. Free
_____d. Class 4	4. Medium

5. Demonstrate the ability to thread a nut.

6. Demonstrate the ability to thread a bolt.

TAP AND DIE THREADING
UNIT V

ANSWERS TO TEST

1. a. Taper - Starting threads in blind hole

   b. Plug - Enlarging thread in blind hole

   c. Bottoming - Completing threads in blind hole

2. Tap Drill Size = Tap Size -- $\frac{1}{\text{Number of threads per inch}}$

   5/16 = 3/8 - 1/16

3. (As shown by instructor)

4. a. (2)

   b. (3)

   c. (4)

   d. (1)

5. Performance skills to be evaluated by instructor.

6. Performance skills to be evaluated by instructor.

HACKSAWS, FILES, AND MISCELLANEOUS
UNIT VI

TERMINAL OBJECTIVES

After completion of Unit VI, the student should be able to select and properly operate a hacksaw and file. He should also be able to recondition a screwdriver tip and a grinding wheel. This will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Explain the 3 factors to consider when selecting hacksaw blades.
2. Select blades by number of teeth per inch for common cutting jobs.
3. Match the names of the parts of a file to the appropriate part.
4. Describe the cross sectional shape of various files when given the names.
5. Explain how file cut is designated and how it relates to file length.
6. Explain how to prevent or reduce pinning.
7. Demonstrate the ability to straight and draw file.
8. Demonstrate the ability to recondition a screwdriver tip.
9. Match the type grinding wheel to the grit per linear inch.
10. Name the reasons for using the right size of an arbor hole.
11. Demonstrate the ability to dress and true a grinding wheel.

HACKSAWS, FILES, AND MISCELLANEOUS
UNIT VI

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information and assignment sheets
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information sheets
6. Demonstrate and discuss procedures outlined in the job sheets
7. Give test

Student:

1. Read objectives
2. Study information sheet
3. Demonstrate the ability to accomplish the procedures outlined in the job sheets
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheets
3. Transparency Masters
    - TM 1--Cutting Cold Metal with a Hacksaw
    - TM 2--Hand Files
4. Job Sheets
    - #1 Filing
    - #2 Reshaping a Screwdriver
    - #3 Reconditioning a Grinding Wheel
5. Test
6. Answers to test

References:

1. Jones, Mack M. Shopwork on the Farm. McGraw-Hill Book Co., New York, New York.

2. Wakeman, T.J. and McCoy, V.E. The Farm Shop, The Macmillan Co., New York, New York.

HACKSAWS, FILES, AND MISCELLANEOUS
UNIT VI

INFORMATION SHEET

I. Factors to Consider When Selecting Hacksaw Blades

   A. The size, shape and composition of material to be cut

   B. The type of frame to be used

   C. The composition, heat treatment, dimensions, pitch, and set of teeth

II. Hacksaw Frames

   A. Frame types by shape

      1. Pistol Grip

      2. Straight handle

   B. Frames by blade length

      1. Adjustable

      2. Solid

   C. Parts of the frame

      1. Handle

      2. Frame

      3. Blade

      4. Tension screw

      5. Pins

III. Hacksaw Blades

   A. Blades can be made of

      1. High carbon steel

      2. Tungsten

      3. High speed steel

INFORMATION SHEET

B. Blade specification factors

1. "All Hard" or "Flexible"
2. Lengths - 8"-12" - "Center of holes"
3. Thickness - .025"
4. Width - 7/16" to 1/2"
5. Teeth per inch - 14-32
    a. 14 - Soft, thick material
    b. 18,24 - General purpose
    c. 32 - hard or thin metal
    d. Have at least two teeth cutting at any time
6. Set of teeth
    a. Regular - (alternate)
    b. Wave - (double alternate)
    c. Raker

IV. Cutting Speeds and Pressure

A. 40-60 strokes per minute is normal speed

B. Excessive speeds causes heat build up and temper or hardness is lost from teeth

C. Apply enough pressure to cause blade to cut. Broken blades may result is too much pressure is used

V. Procedure for cutting metal with a hacksaw (Transparency 1)

A. Mark the point

B. Place metal in vise

C. Notch the mark with a file

d. Make cut

1. Use long strokes

INFORMATION SHEET

2. Apply pressure on forward stroke

3. Reduce pressure on backward stroke

4. Use 40-60 strokes per minute

E. File to remove small amounts of metal

VI. The file is a cutting tool used to rough cut and finish surfaces where slight reductions in size are necessary

VII. Parts of a file (Transparency 2)

A. Point

B. Face

C. Edge

D. Length

E. Heel

F. Tang

G. Handle

VIII. Kinds of files by cross sectional shape (Transparency 2)

A. Flat double cut

B. Flat single cut

C. Half-round

D. Round

E. Square

F. Crosscut saw

G. Triangular tapered

h. Triangular blunt

IX. Kinds of files by cut (coarseness)

A. Cut or coarseness is indicated by either a numbering or name designation

INFORMATION SHEET

1. Numbers - Coarsest to finest-0,1,2,3,4,5,6,7,8

2. Name - Coarsest to finest-rough, coarse, bastard, vixen, second cut, smooth, dead smooth, single cut bastard

B. The longer the file the larger the teeth

C. Single cut files - 65°-85° teeth

D. Double cut files - 40°-45° teeth and 70°-80° set

X. File Handles

A. Always fit the file with a handle to protect your hand from injury

B. Handle size varies with the size of file used

XI. Cleaning the file (Transparency 2)

A. Metal cuttings fill the teeth of file (pinning) and tend to scratch the work surface and prevent cutting action

B. A wire brush or file card can be used to remove metal particles wedged in teeth

C. A scorer or sharp pointed tool can be used to remove particle left by file card

D. Filling the teeth spaces with chalk will prevent some of the clogging action

E. Drawing a soft piece of metal (copper) or a piece of wood over the teeth parallel to them will help remove "pinnings"

XII. Reshaping a screwdriver

A. Do not round edges

B. Continually cool to restore temper

C. See Job Sheet #2 for procedures on reshaping a screwdriver tip

XIII. Selecting Grinding Wheels

A. Grinding wheels are made of abrasive cutting particles held together by a bonding material. Specifications include grit, diameter, width, size of arbor hole, and maximum speed for operation

INFORMATION SHEET

B. Grit size

1. Grit size indicates number of cutting particles per linear inch
2. Coarse wheel - 30-40- grit
3. Medium sheel - 60 grit
4. Fine wheel - 120 grit

C. Size

1. Indicated by width of wheel and diameter of wheel
2. The larger a wheel the greater the cutting surface speed at a given R.P.M.

D. Arbor hole - use the proper size

1. Too tight a fit may cause the wheel to crack
2. Too large a hole may cause the wheel to become unbalanced

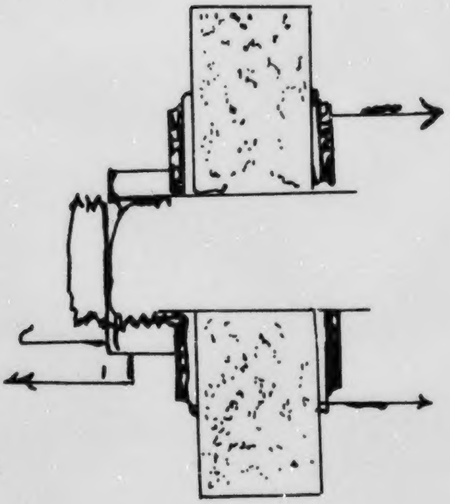
E. Speed of operation

1. Do not operate wheels faster than recommendation stamped on wheel
2. Excess speed may cause a wheel to break up and injure the operator

XIV. Checking and mounting the grinding wheels

A. Check the grinding wheels for flaws, a good wheel will ring clearly when struck gently with a light object.

B. Mounting the grinding wheel



Safety flanges on each side should be at least 1/3 the diameter of the grinding wheel.

The nut should be just tight enough to hold the wheel firmly.

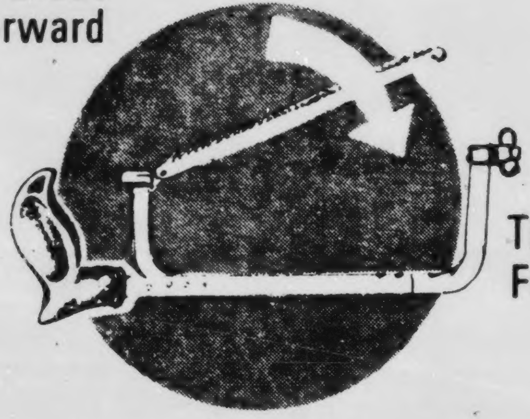
Safety "blotter" placed between the grinding wheel and the safety flanges, should be a little larger than the safety flanges.

C. After mounting the wheel

1. Stand to one side and let the wheel run at full speed.
2. The wheel should be trued with a grinding wheel dresser.
3. The tool rest should be set as close to the wheel as possible, without touching the wheel.

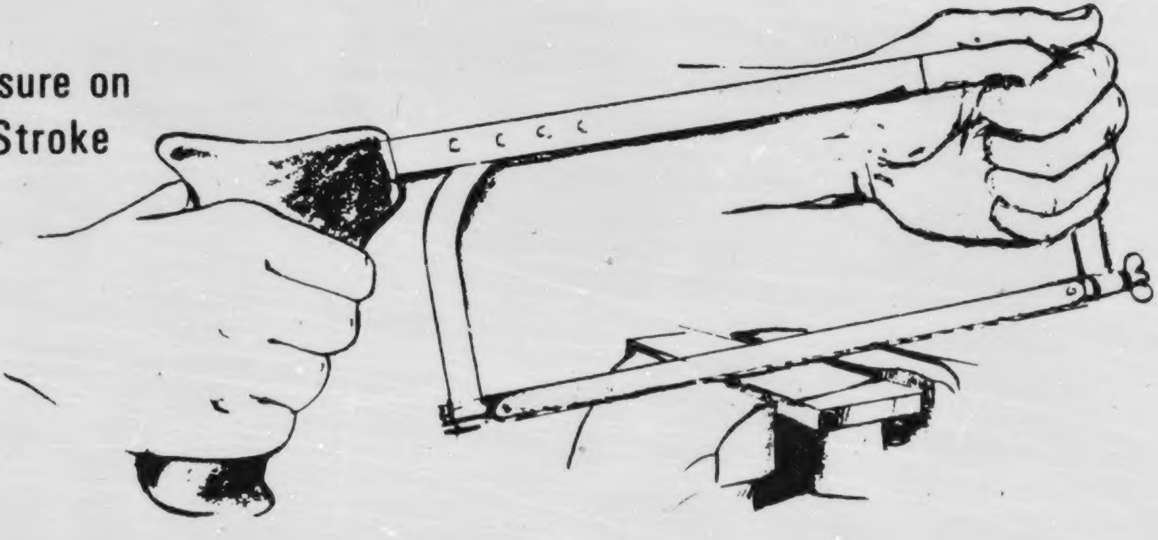
XV. See Job Sheet #3 on procedures of truing a grinding wheel.

Cutting Cold Metal With A Hacksaw



Insert Blade Teeth Forward

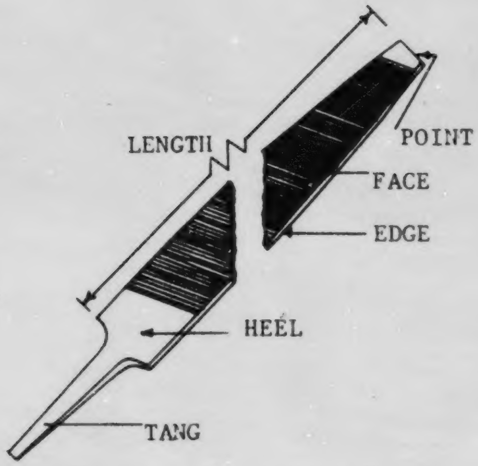
Tighten Firmly



No Pressure on Back Stroke

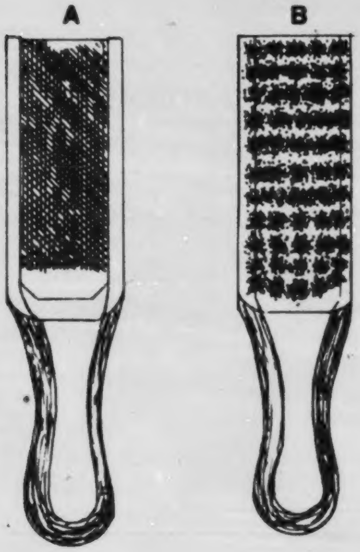
Use Pressure on Forward Stroke

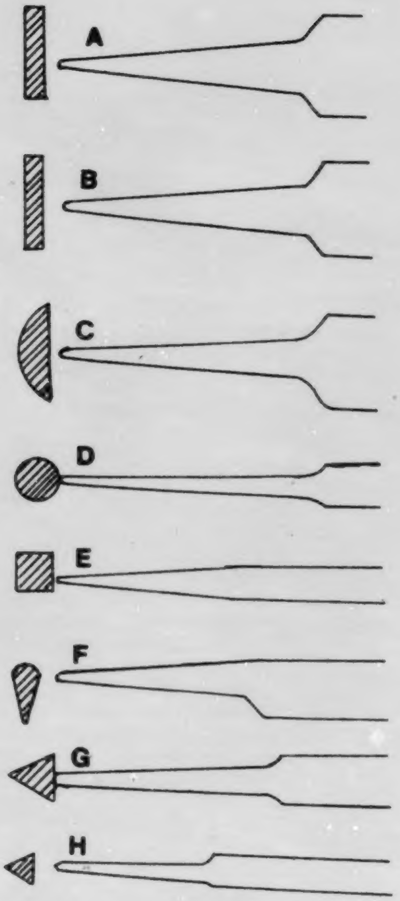
HAND FILES


LENGTH
POINT
FACE
EDGE
HEEL
TANG

The Parts of a File

A--file card,B--file brush





Kinds of files and their cross sections:
A--flat double cut, B--flat single cut,
C--half-round, D--round, E--square,
F--crosscut saw, G--triangular (tapered),
H--triangular (blunt).

HACKSAWS, FILES, AND MISCELLANEOUS
UNIT VI

JOB SHEET #1--FILING

I. Tools and equipment needed

  A. File with handle

  B. File card

  C. Bench vise with soft jaws (optional)

  D. Square

  E. Chalk

  F. Piece of mild steel

II. Procedure - Straight filing

  A. Clamp the metal with surface to be filed just above the jaws of the vise.

  B. Stand with the body slightly to the side of the work.

  C. Grasp the handle in one hand, and hold the file point with the thumb and forefinger in the other hand.

  D. Place the face of the file flat on the metal. Push the file forward, making an even, level stroke the entire length of the file. Apply sufficient down pressure to cause the file to cut.

  E. Lift the file from the work on the back stroke.

  F. Work at 30-40 strokes per minute.

  G. Check frequently with square.

III. Procedure - Drawfiling

  A. Clamp the metal with the surface to be filed high enough above the vise jaws so that the fingers will clear the top of the vise when filing.

  B. Stand with your body directly in line with the clamped stock.

  C. Place the heel of the file on the metal and at right angle to the work.

JOB SHEET #1

D. Push the file straight from your body, applying enough pressure to make the file cut. Keep file flat.

E. Pull file back without down pressure

F. Move file to right and use a clean set of teeth for next stroke. Continue to use clean teeth for each stroke. Clean teeth before reusing.

G. Check frequently with square for trueness and straightness.

HACKSAWS, FILES, AND MISCELLANEOUS
UNIT VI

JOB SHEET #2--RESHAPING A SCREWDRIVER TIP

I. Tools and equipment needed

A. Bench grinder with fine grit stone

B. Goggles

C. Damaged screw driver

D. Pan of water to cool bit

II. Procedure

A. Place the blade flat on the tool rest and push the tip lightly against the grinding wheel to square the tip and remove any gaps. Grind the tip back until it is slightly thicker than the desired thickness of the finished tip.

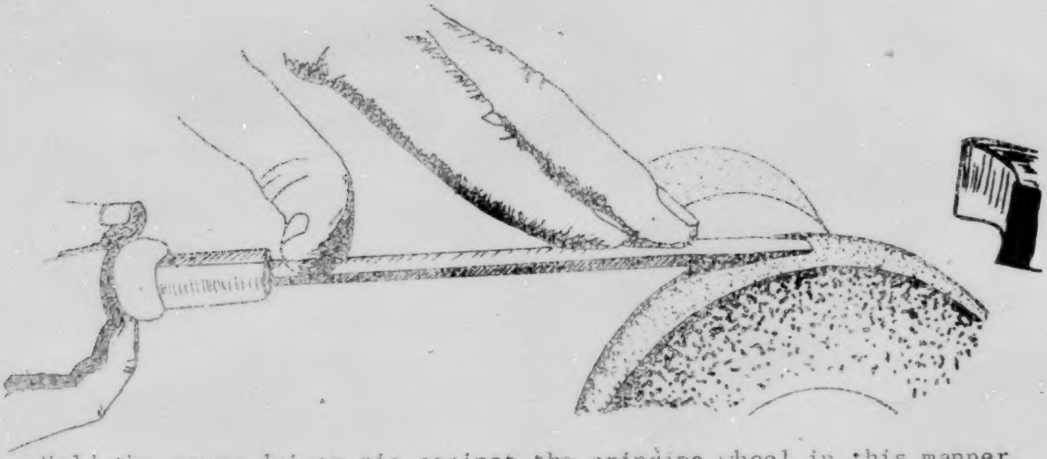
(NOTE: Be careful to not overheat blade and destroy temper. Cool frequently in pan of water.)

B. Grasp the screw-driver handle in the right hand and place the tip on top of the grinding wheel. (Figure 1)

C. Apply light pressure on top of the blade with the left hand, and move the tip back and forth the length of the flat surface until it is ground to the proper shape. Grind both sides and maintain sufficient tip thickness to fill the screw slot. DO NOT ROUND OFF THE ENDS. (figure 2)

Diagram of the Procedure

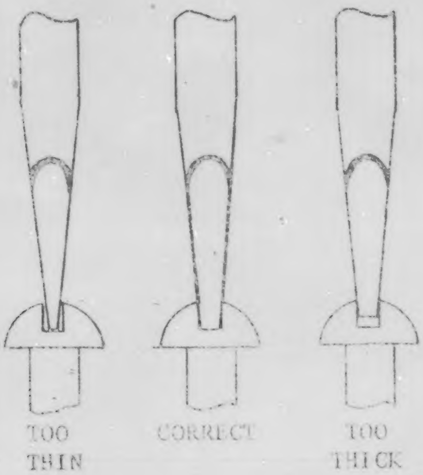
FIGURE 1



Hold the screw-driver tip against the grinding wheel in this manner.

Testing Shape of Screw-Driver Tip

FIGURE 2


TOO
THIN
CORRECT
TOO
THICK

HACKSAWS, FILES, AND MISCELLANEOUS
UNIT VI

JOB SHEET #3--RECONDITIONING A GRINDING WHEEL

I. Tools and equipment needed

  A. Grinder

  B. Goggles

  C. Grinding - Wheel dresser - (Star dresser)

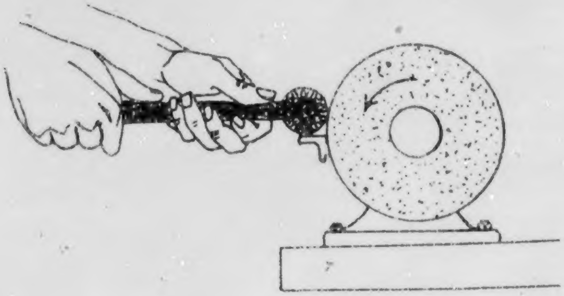
II. Procedure for removing glaze and truing wheel

  A. Move the tool rest in line with the center of the wheel arbor and hold a 1/16" to 1/8" clearance between the rest and wheel face. Start the motor.

  B. Grasp the grinding-wheel dresser with both hands held close to the body. Place the dresser on the tool rest, with about 1/3 of the cutters to the right of the wheel. Move the tool from right to left (move the whole body), while applying steady pressure against the wheel with the tool and stopping with 1/3 of the cutters to the left of the wheel. Repeat until glaze is removed and wheel is true.

  C. Shut off motor. Check trueness and squareness with combination square.

III. Diagram of the procedure



HACKSAWS, FILES, AND MISCELLANEOUS
UNIT VI

TEST

1. Explain the 3 factors you should consider when selecting a hacksaw blade.

   a.

   b.

   c.

2. Which blade would you use for each job. 14 teeth/inch, 18 teeth/inch, 32 teeth/inch

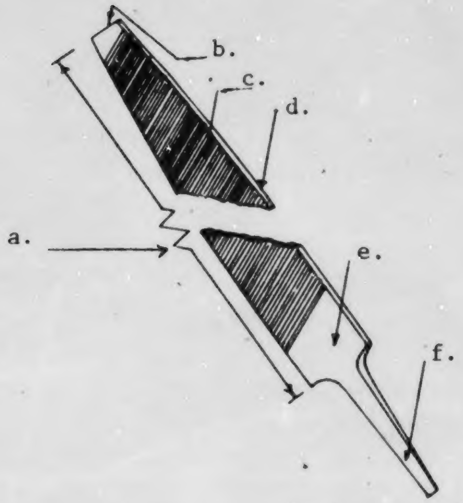
   a. Soft Metal (Aluminum) -

   b. Mild Steel -

   c. Hard Metal -

   d. Thin Metal -

3. Match correctly the parts of a file.



a.______________________

b.______________________

c.______________________

d.______________________

e.______________________

f.______________________

4. Describe the cross section shape of a file for each of the indicated types.

   a. Flat

   b. Square

   c. Round

   d. Triangular

5. Explain how file cut is designated and how it relates to file length.

6. Explain how to reduce or prevent pinning.

7. Name the grit for each of the following grinding wheels.

   a. Course wheel______________________

   b. Fine wheel________________________

   c. Medium wheel______________________

8. What will happen if the arbor hole is:

   a. Too tight

   b. Too loose

9. Demonstrate the ability to recondition a grinding wheel.

   (NOTE: If this has not been accomplished prior to the test, ask the instructor when the above activity should be completed.)

HACKSAWS, FILES, AND MISCELLANEOUS
UNIT VI

ANSWERS TO TEST

1. a. Size, shape and composition of material to be cut.

   b. Type of hacksaw frame

   c. Composition, heat treatment, dimension, pitch and set of teeth of blades available.

2. a. 14

   b. 18

   c. 32

   d. 32

3. a. Length

   b. Point

   c. Face

   d. Edge

   e. Heel

   f. Tang

4. a. ▭

   b. □

   c. ○

   d. △

5. By name - rough, coarse, bastard, vixen,
   Second cut - smooth, dead smooth, single cut bastard

   By numbers - 0 through 8. Coarsest to finest
   The longer the file the coarser the tooth.

6. a. Chalking will help prevent it

   b. File card or wire brush can be used to clean

   c. Soft metal or wood can be used to remove pinning

7. a. 30-40 grit

   b. 120 grit

   c. 60 grit

8. a. Wheel may crack

   b. May become unbalanced

9. Performance skills to be evaluated by the instructor

INTRODUCTION TO OXYACETYLENE CUTTING
UNIT VII

TERMINAL OBJECTIVES

After completion of Unit VII, the student should be able to list the characteristics of the gases used and identify parts of the oxyacetylene cutting equipment. He should also be able to turn on, light, adjust to a neutral flame, and turn off the oxyacetylene equipment following the correct procedure and observing safety precautions. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define terms associated with oxyacetylene cutting.
2. List five safety precautions to observe when handling oxyacetylene equipment.
3. Write the characteristics of gases used in oxyacetylene cutting.
4. List the three components of a fire triangle.
5. Identify parts of oxyacetylene cutting equipment.
6. Identify three types of flames.
7. Demonstrate the ability to:
    a. Set up the oxyacetylene cutting equipment.
    b. Turn on, light, adjust to a neutral flame, and turn off the oxyacetylene equipment.

INTRODUCTION TO OXYACETYLENE CUTTING
UNIT VII

SUGGESTED ACTIVITIES

Instructor:

1. Provide student with objective sheet
2. Provide students with information and job sheets
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information sheet
6. Demonstrate and discuss procedures outlined in job sheets
7. Give test

Student:

1. Read objectives
2. Study information sheet and take notes
3. Complete the procedures outlined in the job sheets
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheet
3. Transparency masters
    TM 1--The Fire Triangle
    TM 2--Oxyacetylene Cutting Equipment
    TM 3--Welding Regulators
    TM 4--Oxyacetylene Cutting Flames
4. Job sheets
    Job Sheet #1--Set Up Oxyacetylene Equipment
    Job Sheet #2--Turn On, Light, Adjust the Cutting Torch to a Neutral Flame, and Turn Off the Oxyacetylene Cutting Equipment
5. Test
6. Answers to test

References:

1. Smith's Instructor's Manual for a Basic Course in Oxyacetylene Brazing, (Form 424). Minneapolis, Minnesota: Smith Welding Equipment, Division of Tescom Corporation.

2. Phipps, Lloyd J. Mechanics in Agriculture. Danville, Illinois: Interstate Printers and Publishers, Inc., 1967.

3. Oxyacetylene Flame Tracts (Form 235). Minneapolis, Minnesota: Smith Welding Equipment, Division 7 Tescom Corporation.

4. Althouse, Andrew D., Carl H. Turnquist, and William A. Bowditch. Modern Welding. Homewood, Illinois: Goodheart-Villcox Co., Inc., 1970.

INTRODUCTION TO OXYACETYLENE CUTTING
UNIT VII

INFORMATION SHEET

I. Terms and definitions

A. Oxyacetylene cutting--The severing of ferrous metals by heating and rapid oxidation of metal with pure oxygen

B. Oxidation--Combining oxygen with another substance

C. Oxide--Term usually applied to rust, corrosion, coating, film, or scale

(NOTE: Oxygen combines with metal causing oxides.)

D. Backfire--A short "pop" of the torch flame followed by extinguishing of the flame or continued burning of the gases

E. Flashback--Fire burning inside the torch

F. Purge--Clear or make free of foreign material or impurities

II. Safety precautions for handling oxyacetylene equipment

(NOTE: The Mathematics of Safety--Accidents SUBTRACT from your pleasure, ADD to your miseries, DIVIDE your income, and MULTIPLY your worries.

A. Blow out cylinder valve (crack valve for a second) before attaching regulators

B. Release adjusting screw on regulator before opening cylinder valve

C. Stand to side of regulator when opening cylinder valve

D. Open cylinder valves slowly

E. Do not use acetylene (in free state) at pressures higher than 15 PSI

F. Purge oxygen and fuel gas passages (individually) before lighting torch

G. Light fuel gas before opening oxygen valve on torch

H. Use no oil on regulator, torches, fittings, etc.

I. Do not use oxygen as a substitute for compressed air

J. Keep heat, flames, and sparks away from combustibles

INFORMATION SHEET

III. Characteristics of gases

A. Acetylene

1. Colorless
2. Has distinct odor
3. Combustible

(NOTE: When combined with oxygen, acetylene produces a flame of about 5900°-6300° F.)

B. Oxygen

1. Colorless
2. Odorless
3. Tasteless
4. Supports and intensifies combustion

IV. Components of a fire triangle (Transparency 1)

A. Fuel--Any combustible material

B. Heat--Enough to raise the fuel to its ignition temperature

C. Oxygen--Necessary to sustain combustion

(NOTE: To produce fire, these three elements are necessary and must be present at the same time. If any one of the three is missing, a fire cannot be started or, with the removal of any one, the fire will be extinguished.)

V. Parts of oxyacetylene equipment (Transparencies 2 and 3)

A. Oxygen cylinder

B. Oxygen cylinder valve

C. Acetylene cylinder

D. Acetylene cylinder valve

E. Acetylene regulator

INFORMATION SHEET

F. Oxygen regulator

G. Cylinder truck

H. Safety chain

I. Acetylene fitting

(NOTE: Acetylene fitting has left-handed threads and a hex-grooved nut.)

J. Oxygen fitting

(NOTE: Oxygen fitting has right-handed threads.)

K. Acetylene torch valve

L. Oxygen torch valve

M. Torch body

N. Cutting attachment

O. Oxygen cutting lever

P. Oxygen preheat valve

Q. Tip nut

R. Slip-in tip

VI. Types of flames (Transparency 4)

A. Carburizing--Burns an excess of acetylene

(NOTE: A carburizing flame may be identified by the feathery edges of the white cone.)

B. Oxidizing--Burns excess of oxygen

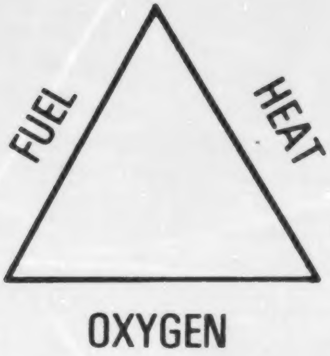
(NOTE: An oxidizing flame may be identified by the short white inner cone.)

C. Neutral--Burns equal amounts of oxygen and acetylene

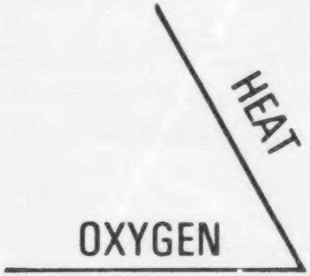
(NOTE: A neutral flame may be identified by a clear, well defined white cone.)

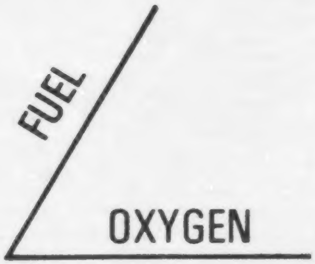
The Fire Triangle

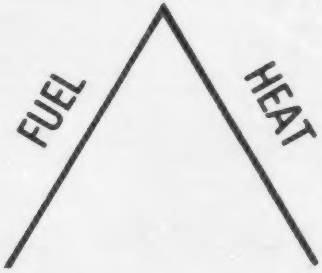
To produce fire, three things must be present at the same time.


FUEL
HEAT
OXYGEN

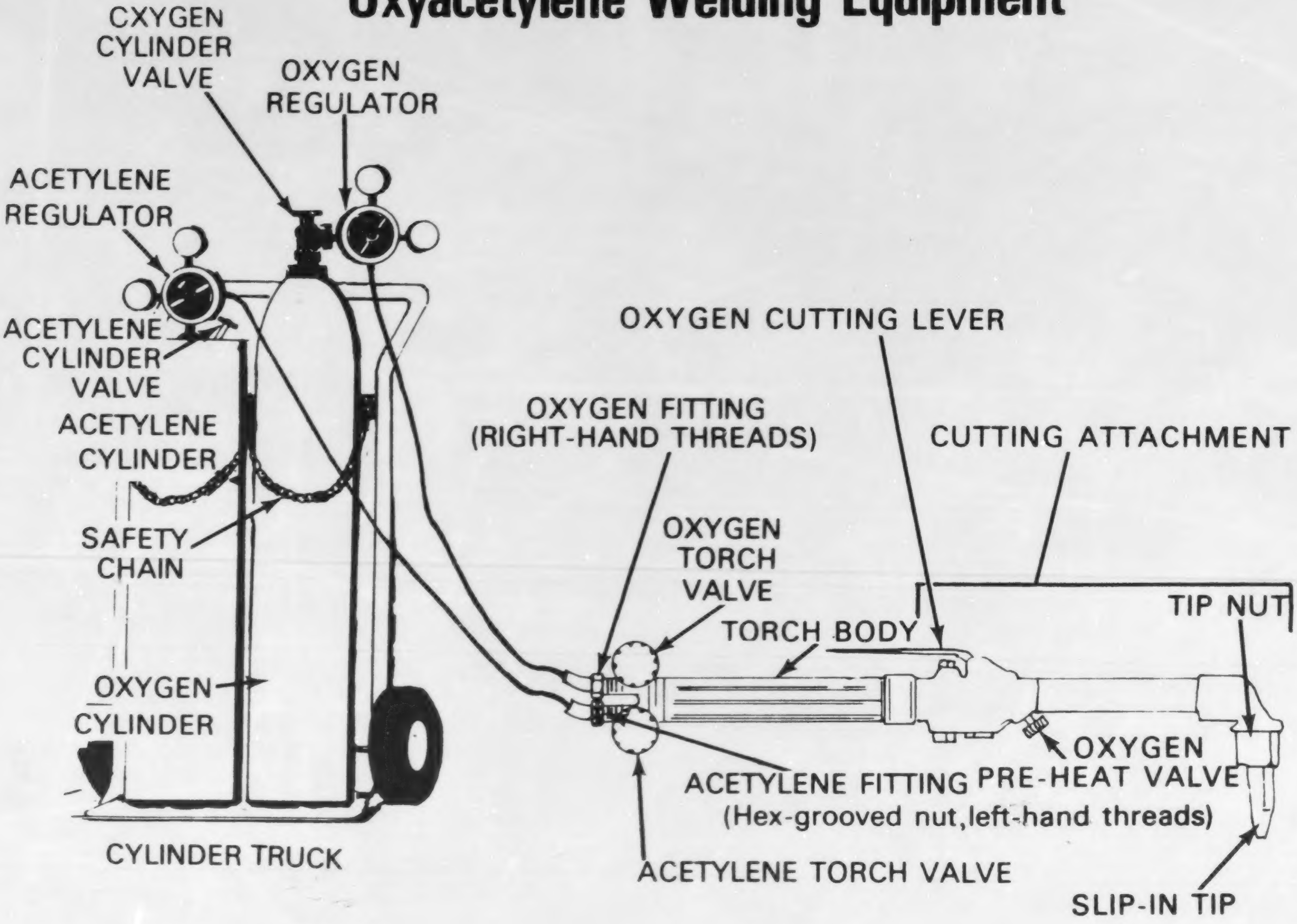
If any one of the three is missing, a fire cannot be started or, with the removal of any one, the fire will be extinguished.


HEAT
OXYGEN


FUEL
OXYGEN



Oxyacetylene Welding Equipment

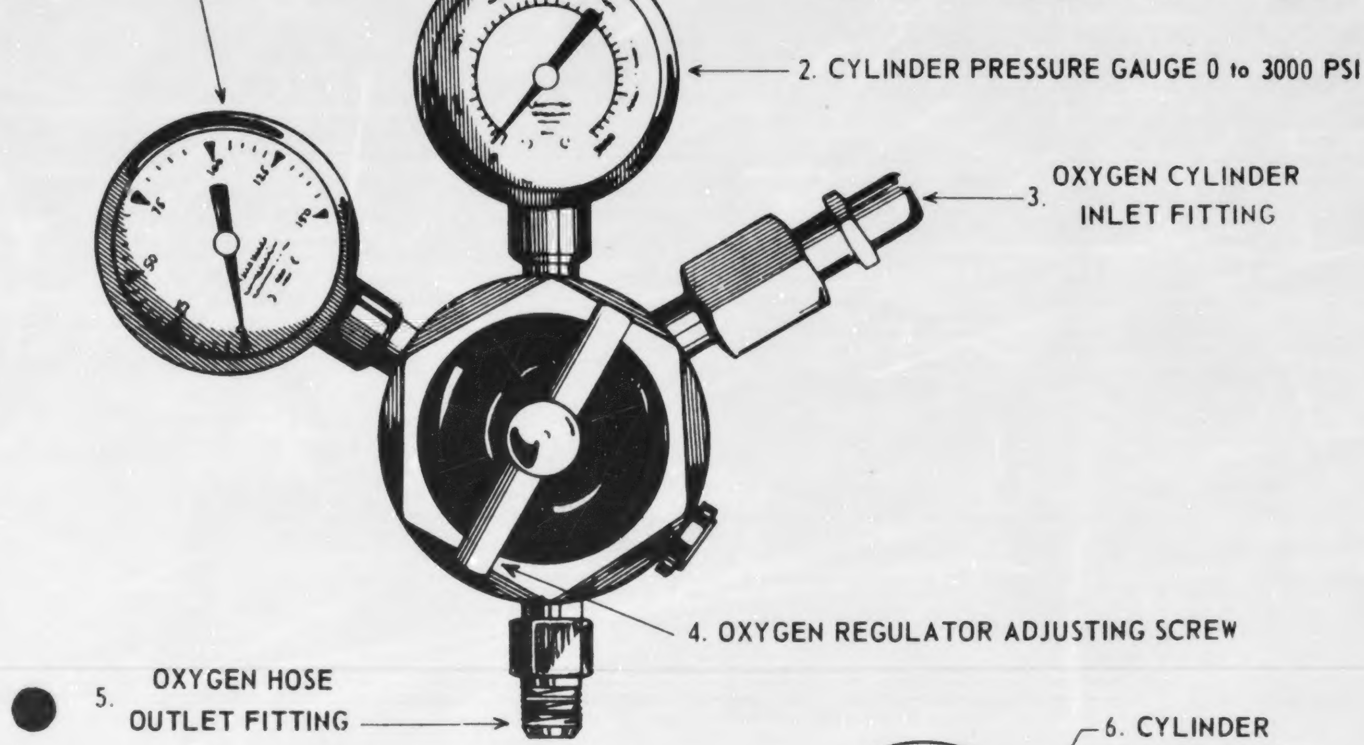

CXYGEN CYLINDER VALVE
OXYGEN REGULATOR
ACETYLENE REGULATOR
ACETYLENE CYLINDER VALVE
ACETYLENE CYLINDER
SAFETY CHAIN
OXYGEN CYLINDER
CYLINDER TRUCK
OXYGEN CUTTING LEVER
OXYGEN FITTING (RIGHT-HAND THREADS)
CUTTING ATTACHMENT
OXYGEN TORCH VALVE
TORCH BODY
TIP NUT
OXYGEN PRE-HEAT VALVE
ACETYLENE FITTING (Hex-grooved nut, left-hand threads)
ACETYLENE TORCH VALVE
SLIP-IN TIP

TM 2

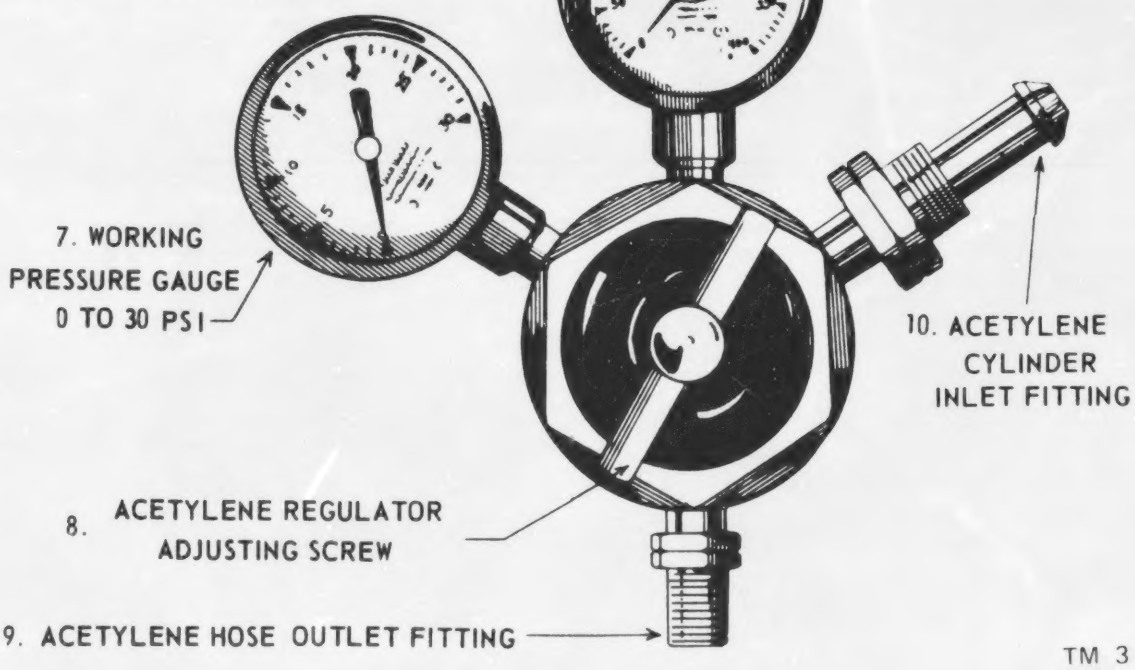
Ag. I - 215-F

Welding Regulators

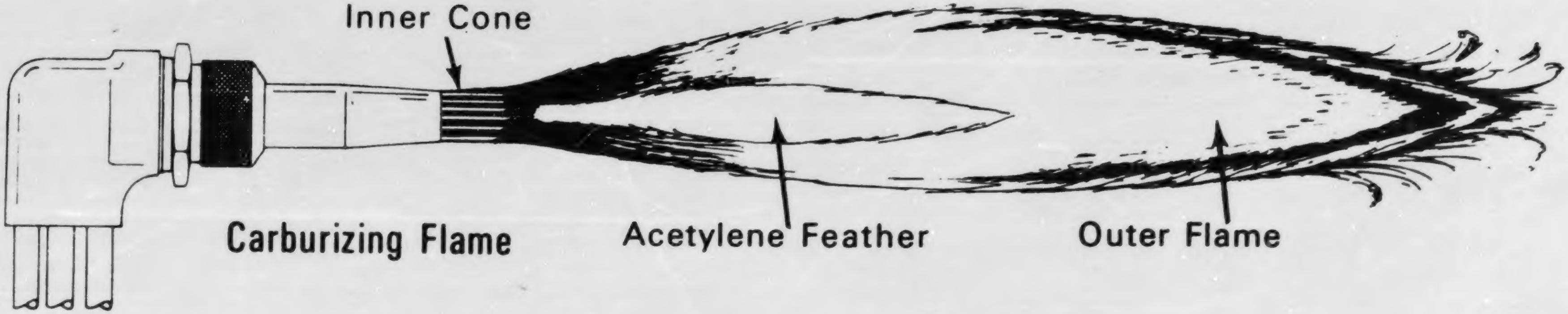
A. OXYGEN REGULATOR GAUGES


1. WORKING PRESSURE GAUGE 0-150 PSI
2. CYLINDER PRESSURE GAUGE 0 to 3000 PSI
3. OXYGEN CYLINDER INLET FITTING
4. OXYGEN REGULATOR ADJUSTING SCREW
5. OXYGEN HOSE OUTLET FITTING

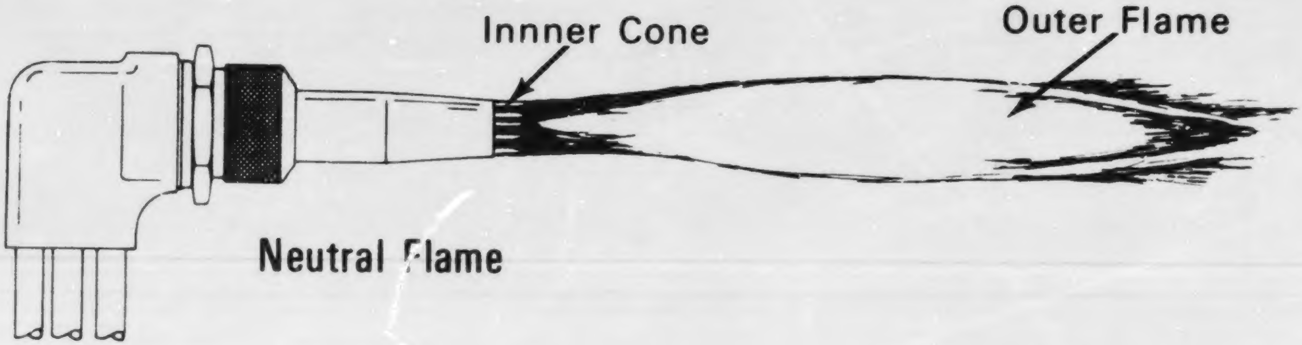
B. ACETYLENE REGULATOR


6. CYLINDER PRESSURE GAUGE 0-400 PSI
7. WORKING PRESSURE GAUGE 0 TO 30 PSI
8. ACETYLENE REGULATOR ADJUSTING SCREW
9. ACETYLENE HOSE OUTLET FITTING
10. ACETYLENE CYLINDER INLET FITTING

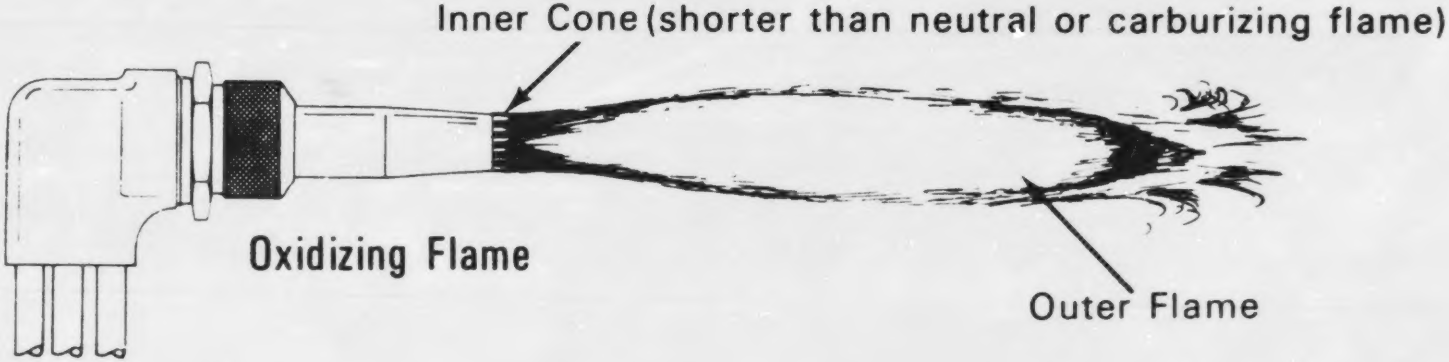
Oxyacetylene Cutting Flames


Inner Cone
Acetylene Feather
Outer Flame

Carburizing Flame


Innner Cone
Outer Flame

Neutral Flame


Inner Cone (shorter than neutral or carburizing flame)
Outer Flame

Oxidizing Flame

TM 4

Ag. I - 219-F

INTRODUCTION TO OXYACETYLENE CUTTING
UNIT VII

JOB SHEET #1--SET UP OXYACETYLENE EQUIPMENT

I. Tools and materials needed

   A. Oxygen cylinder

   B. Acetylene cylinder

   C. Oxygen regulator

   D. Acetylene regulator

   E. Hoses

   F. Wrench

   G. Cylinder holder

   H. Water container

   I. Ivory soap

   J. Clean paint brush

   K. Torch body with cutting attachment

II. Procedure

   A. Fasten cylinders in a vertical position

   B. Remove caps from cylinders

   C. Crack valves of each cylinder, then close valves

   D. Connect oxygen regulator to oxygen cylinder

      1. Turn adjusting screw on regulator counterclockwise until tension on spring is released

      2. Slowly turn cylinder valve wide open

   E. Connect acetylene regulator to acetylene cylinder

      1. Turn adjusting screw on regulator counterclockwise until tension on spring is released

      2. Open cylinder valve 1/2 to 3/4 of a turn (never more than 1 1/2 turns)

F. Connect acetylene hose to acetylene regulator and purge hose

G. Connect oxygen hose to oxygen regulator and purge hose

H. Connect torch body to oxygen and acetylene hose and close both valves on torch body

I. Attach cutting attachment to torch body

(NOTE: The size tip is determined by the thickness of metal to be cut and the manufacturer's recommendations.)

J. Close oxygen preheat valve on cutting attachment

K. Turn adjusting screw on oxygen regulator clockwise until working pressure is reached

L. Turn adjusting screw on acetylene regulator clockwise until correct working pressure is reached

M. Test all connections for leaks with Ivory soap suds and water

(NOTE: Apply soap suds with a clean paint brush.)

INTRODUCTION TO OXYACETYLENE CUTTING
UNIT VII

JOB SHEET #2--TURN ON, LIGHT, ADJUST THE CUTTING TORCH TO A NEUTRAL FLAME, AND TURN OFF THE OXYACETYLENE CUTTING EQUIPMENT

I. Tools and materials needed

A. Oxygen cylinder

B. Acetylene cylinder

C. Hoses

D. Oxygen and acetylene regulators

E. Torch body

F. Cutting attachment with slip-in tip

G. Cylinder holder and hose rack

H. Flint lighter

I. Wrench

J. Gloves

K. Safety goggles

L. Coveralls or protective clothing

II. Procedure for turning on, lighting, and adjusting the cutting torch to a neutral flame

A. Check all cylinder, regulator, and torch valves to make sure they are off

B. Open acetylene cylinder valve 1/2 to 3/4 of a turn (never more than 1 1/2 turns)

C. Open acetylene valve on torch one turn

JOB SHEET #2

D. Turn adjusting screw on acetylene regulator clockwise until desired pressure is reached*

E. Close acetylene valve on torch

F. Open oxygen cylinder valve all the way

G. Open oxygen torch valve all the way

H. Open oxygen preheat valve on cutting attachment one turn

I. Turn adjusting screw on oxygen regulator clockwise until desired pressure is reached*

J. Close oxygen preheat valve on cutting attachment

K. Open acetylene valve on torch 1/4 turn

L. Light the torch with flint lighter and adjust until smoke on flame clears

M. Open oxygen preheat valve slowly and adjust to a neutral flame

N. Depress the oxygen cutting lever and check to see that a neutral flame is present

(NOTE: If necessary, adjust the oxygen preheat valve with the oxygen cutting lever depressed until a neutral flame is secured.)

(*NOTE: Oxygen and acetylene pressures and size of tip depend upon the thickness of metal to be cut. Use pressures and tip size recommended by manufacturer.)

III. Procedure for turning off the flame and oxyacetylene unit

A. Close acetylene valve on torch

B. Close oxygen preheat valve

C. Close acetylene cylinder valve

D. Close oxygen cylinder valve

E. Open acetylene valve on torch

(NOTE: When gauges reach 0, close torch valve and release adjusting screw on acetylene regulator by turning counterclockwise.)

JOB SHEET #2

F. Open oxygen preheat valve on torch

(NOTE: When gauges reach 0, close oxygen preheat valve and release adjusting screw on oxygen regulator by turning counterclockwise.)

G. Close oxygen valve on torch

H. Place torch and hose on hanger or brackets provided

INTRODUCTION TO OXYACETYLENE CUTTING
UNIT VII

TEST

1. Define the following terms associated with oxyacetylene cutting.

    a. Oxyacetylene cutting-

    b. Backfire-

    c. Purge-

    d. Oxidation-

    e. Flashback-

    f. Oxide-

2. List five safety precautions to observe when handling oxyacetylene equipment.

    a.

    b.

    c.

    d.

    e.

3. Write the characteristics of the gases used in oxyacetylene cutting.

    a. Acetylene

    b. Oxygen

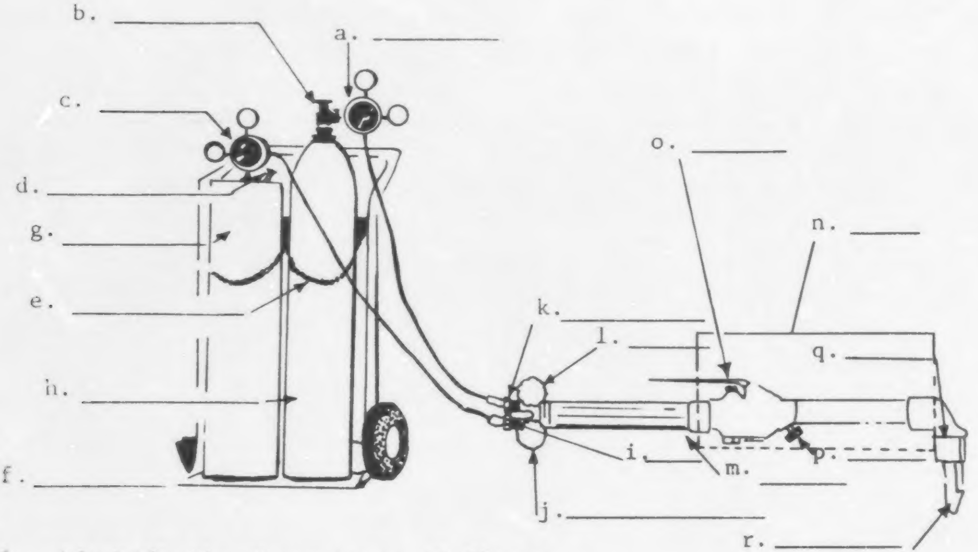
4. List the three components of a fire triangle.

    a.

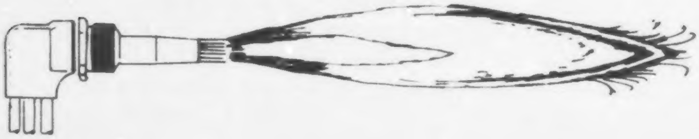
    b.

    c.

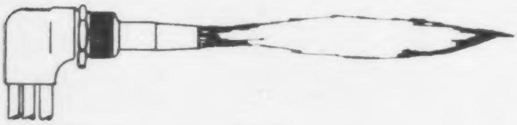
5. Identify the parts of oxyacetylene cutting equipment.



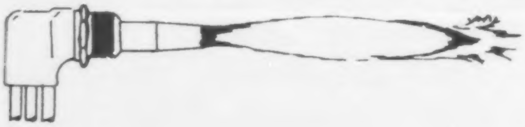
6. Identify the three types of flames.



a. ______________________________



b. ______________________________



c. ______________________________

7. Demonstrate the ability to:

   a. Set up the oxyacetylene cutting equipment.

   b. Turn on, light, adjust to a neutral flame and turn off the oxyacetylene cutting equipment.

   (NOTE: If this has not been accomplished prior to the test, ask the instructor when the above activities should be completed.)

INTRODUCTION TO OXYACETYLENE CUTTING
UNIT VII

ANSWERS TO TEST

1. a. Oxyacetylene cutting--The severing of ferrous metal by heating and rapid oxidation of metal with pure oxygen

   b. Backfire--A short "pop" of the torch flame followed by the extinguish of the flame or continued burning of the gases

   c. Purge--Clear or make free of foreign material or impurities

   d. Oxidation--Combining oxygen with another substance

   e. Flashback--Fire burning inside the torch

   f. Oxide--Term usually applied to rust, corrosion, coating, film, or scale

2. Any five of the following

   a. Blow out cylinder valve (crack valve for a second) before attaching regulators

   b. Release adjusting screw on regulator before opening cylinder valve

   c. Stand to side of regulator when opening cylinder valve

   d. Open cylinder valves slowly

   e. Do not use acetylene (in free state) at pressures higher than 15 PSI

   f. Purge oxygen and fuel gas passages (individually) before lighting torch

   g. Light fuel gas before opening oxygen valve on torch

   h. Use no oil on regulators, torches, fittings, etc.

   i. Do not use oxygen as a substitute for compressed air

   j. Keep heat, flames, and sparks away from combustibles

3. a. Acetylene

      1. Colorless

      2. Has distinct odor

      3. Combustible

- b. Oxygen
  1. Colorless
  2. Odorless
  3. Tasteless
  4. Supports and intensifies combustion

4. a. Fuel
   b. Heat
   c. Oxygen

5. a. Oxygen regulator
   b. Oxygen cylinder valve
   c. Acetylene regulator
   d. Acetylene cylinder valve
   e. Safety chain
   f. Cylinder truck
   g. Acetylene cylinder
   h. Oxygen cylinder
   i. Acetylene fitting
   j. Acetylene torch valve
   k. Oxygen fitting
   l. Oxygen torch valve
   m. Torch body
   n. Cutting attachment
   o. Oxygen cutting lever
   p. Oxygen preheat valve
   q. Tip nut
   r. Slip-in tip

6. a. Carburizing

   b. Neutral

   c. Oxidizing

7. Performance skills will be evaluated to the satisfaction of the instructor.

OXYACETYLENE CUTTING
UNIT VIII

TERMINAL OBJECTIVES

After completion of Unit VIII, the student should be able to list purposes of a slag box, describe the results when a backfire and a flashback takes place, and perform cutting skills with the cutting torch by making ninety degree cuts, bevel cuts, and cutting holes in mild steel. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with oxyacetylene cutting to the correct definition.
2. Identify the parts of the torch body and cutting attachment.
3. List the purposes of a slag box.
4. List five reasons for poor cuts.
5. List four causes of a backfire.
6. Describe the results when a backfire takes place.
7. Describe the results when a flashback takes place.
8. List in the proper order the steps to follow in case of flashback.
9. Demonstrate the ability to:
    a. Lay out a pattern on metal to be cut with the aid of a straightedge and soapstone.
    b. Make ninety degree cuts in mild steel and restart a cut.
    c. Make a flame beveled cut on mild steel plate.
    d. Cut a hole in mild steel.

OXYACETYLENE CUTTING
UNIT VIII

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information and job sheets
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information sheet
6. Demonstrate and discuss procedures outlined in job sheets
7. Give test

Student:

1. Read objective sheet
2. Study information sheet
3. Demonstrate the ability to accomplish the procedures outlined in the job sheets
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheet
3. Transparency master
    TM 1--Parts of a Torch Body and Cutting Attachment
4. Job sheets
    Job Sheet #1--Lay out a Pattern on Mild Steel Plate
    Job Sheet #2--Make Ninety Degree Cuts on Mild Steel and Restart a Cut
    Job Sheet #3--Make a Flame Beveled Cut on Mild Steel Plate
    Job Sheet #4--Cut a Hole in Mild Steel
5. Test
6. Answers to test

References:

1. Althouse, Andrew D., Carl H. Turnquist, and William A. Bowditch. Modern Welding. Homewood, Illinois: Goodheart-Willcox Co., Inc., 1970.

2. Phipps, Lloyd J., H. F. McColly, L.L. Scranton, and G.C. Cook. Farm Mechanics Text and Handbook. Danville, Illinois: Interstate Printers and Publishers, Inc.

3. Smith's Short Course for Gas Cutting, Welding, and Brazing. Minneapolis, Minnesota: Education Department of Smith Welding Equipment, Division of Tescom Corporation.

4. The Oxyacetylene Handbook: A Manual on Oxyacetylene Welding and Cutting Procedures. New York: Union Carbide Corporation, Linde Division.

OXYACETYLENE CUTTING
UNIT VIII

INFORMATION SHEET

I. Terms and definitions

A. Flashback--Fire inside torch

(CAUTION: This is a very dangerous condition.)

B. Backfire--Momentary burning back of the flame into the tip

(NOTE: This is usually accompanied by a loud pop and extinguishing of the flame.)

C. Flame cutting--A process by which iron or steel is heated to a temperature where it can be rapidly oxidized by high purity oxygen flowing under pressure through a cutting torch

(NOTE: As the metal is oxidized, the preheat flame maintains the temperature necessary to keep the oxidation process going in a narrow zone across the length of the base metal.)

D. Slag box--Metal container with a layer of water or sand to catch hot slag

E. Drag line--Refers to the situation in which the most distant portion of the cutting steam lags behind the stream nearest the cutting tip

F. Kerf--Area where the metal was removed in the form of an oxide during the cutting process

G. Oxide--Term usually applied to rust, corrosion, coating, film, or scale

(NOTE: Oxygen combines with the metal causing oxides.)

H. Oxidation--Combining oxygen with another substance

Example: A metal is oxidized when the metal is cut

II. Parts of a cutting torch and tip (Transparency 1)

A. Cutting torch

1. Oxygen fitting

2. Acetylene fitting

3. Oxygen torch valve

4. Acetylene torch valve

INFORMATION SHEET

5. Torch body

6. Oxygen cutting lever

7. Oxygen preheat valve

8. Tip nut

9. Slip-in tip

B. Cutting tip

1. Preheat orifice--Heats metal to kindling point (cherry red) of approximately 1600° F.

2. Cutting orifice--Removes oxidized metal

(NOTE: The selection of the correct tip for the job is determined by the thickness of metal, size of tip orifices, and the oxygen cutting pressures. See manufacturer's recommendations.)

III. Purposes of slag box

A. To catch hot slag

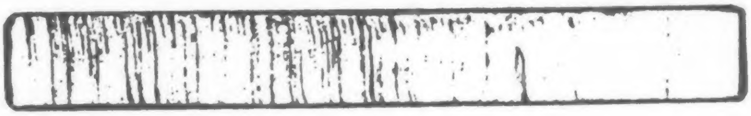
B. To prevent fire

C. To protect clothing

D. To protect welding hoses

IV. Reasons for poor cuts

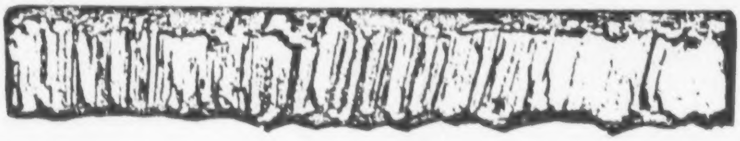
A. This is a correctly made cut in 1 inch plate; the edge is square and the draglines are essentially vertical and not too pronounced



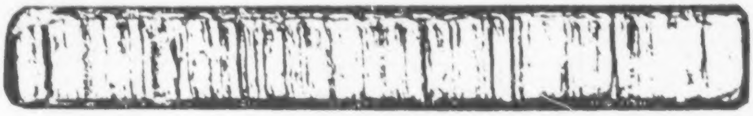
INFORMATION SHEET

B. Preheat flames were too small for this cut with the result that the cutting speed was too slow, causing bad gouging at the bottom

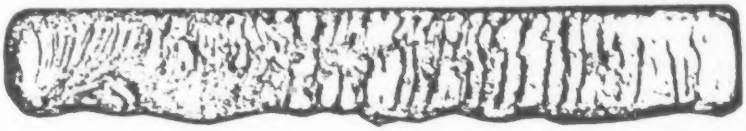
C. Preheat flames were too long with the result that the top surface has melted over, the cut edge is irregular, and there is an excessive amount of adhering slag



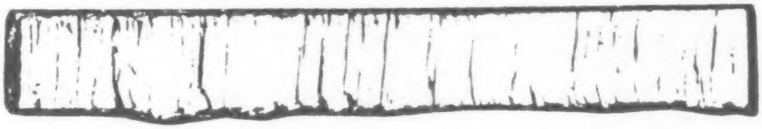
D. Oxygen pressure was too low with the result that the top edge has melted over because of the too slow cutting speed



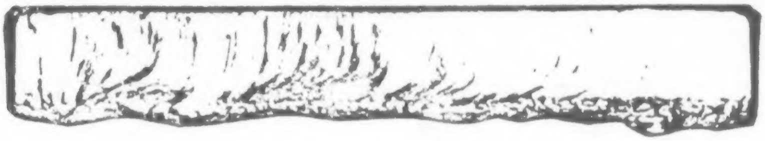
E. Oxygen pressure was too high and the nozzle size too small with the result that the entire control of the cut has been lost



F. Cutting speed was too slow with the result that the irregularities of the draglines are emphasized

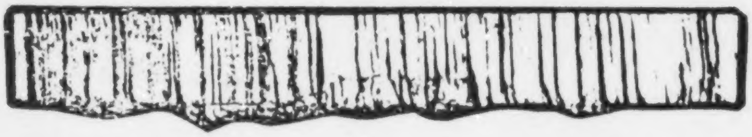


G. Cutting speed was too high with the result that there is a pronounced break to the dragline and the cut edge is irregular

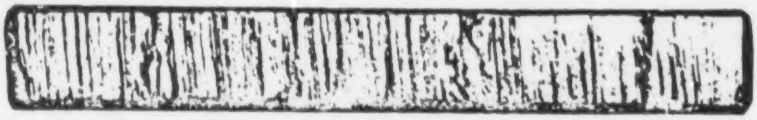


INFORMATION SHEET

H. Blowpipe travel was unsteady with the result that the cut edge is wavy and irregular



I. Cut was lost and not carefully restarted with the result that bad gouges were caused at the restarting point



V. Causes of backfire

A. Insufficient acetylene or oxygen pressure

B. Loose cutting tip

C. Dirty tip

D. Overheating of cutting tip

E. Bad O-ring in torch body

(NOTE: The above causes should be carefully checked to control backfire.)

VI. Results of a backfire

A. Flame burns momentarily back into tip

B. A loud snap or pop results

1. Flame may go out

2. Flame may continue to burn in normal manner

VII. Results of flashback

A. Fire inside torch

B. Disappearance of flame followed by

1. Squealing or hissing noise inside torch

2. Sparks coming from the torch

3. Smoke coming from the torch

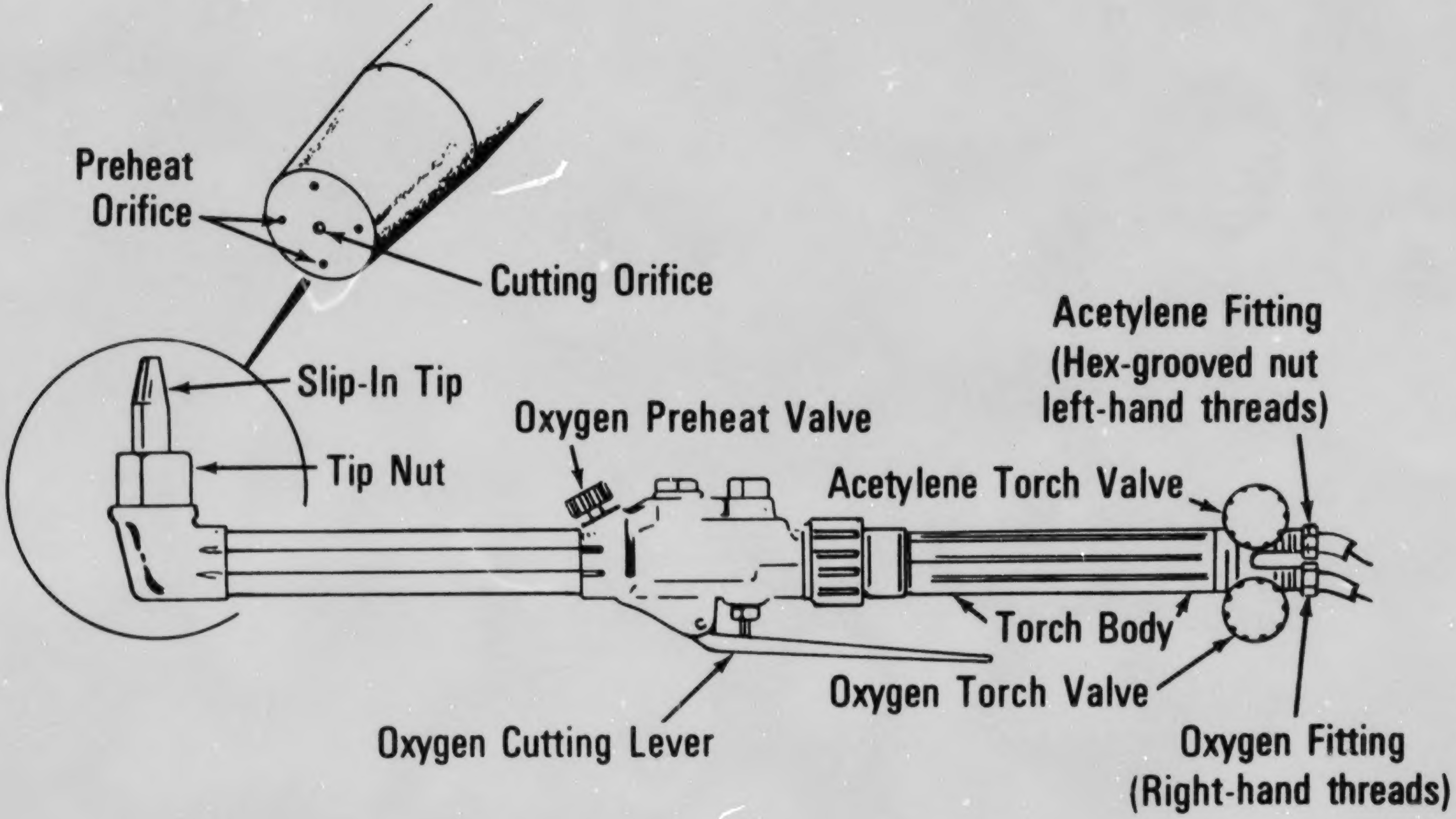
INFORMATION SHEET

VIII. Steps to follow in case of flashback

- A. Close oxygen preheat valve
- B. Close oxygen torch valve
- C. Close acetylene torch valve
- D. Release oxygen regulator screw
- E. Release acetylene regulator screw
- F. Examine acetylene unit
- G. Reset regulator pressures
- H. Light torch

(NOTE: If heavy smoke comes out of the torch tip and the torch body becomes hot, the flashback has probably traveled past the mixing chamber into the hose. In this case, shut off the oxygen cylinder valve and the acetylene cylinder valve, then notify your instructor.)

Parts of a Torch Body and Cutting Attachment


Preheat Orifice
Cutting Orifice
Slip-In Tip
Tip Nut
Oxygen Preheat Valve
Acetylene Fitting (Hex-grooved nut left-hand threads)
Acetylene Torch Valve
Torch Body
Oxygen Torch Valve
Oxygen Cutting Lever
Oxygen Fitting (Right-hand threads)

OXYACETYLENE CUTTING
UNIT VIII

JOB SHEET #1--LAY OUT A PATTERN ON MILD STEEL PLATE

I. Tools and materials needed

   A. Square and straightedge

   B. Soapstone

   C. Mild steel plate 1/4" to 1/2" thick, 6" square

   D. Gloves

   E. Safety goggles

   F. Coveralls or protective clothing

II. Procedure

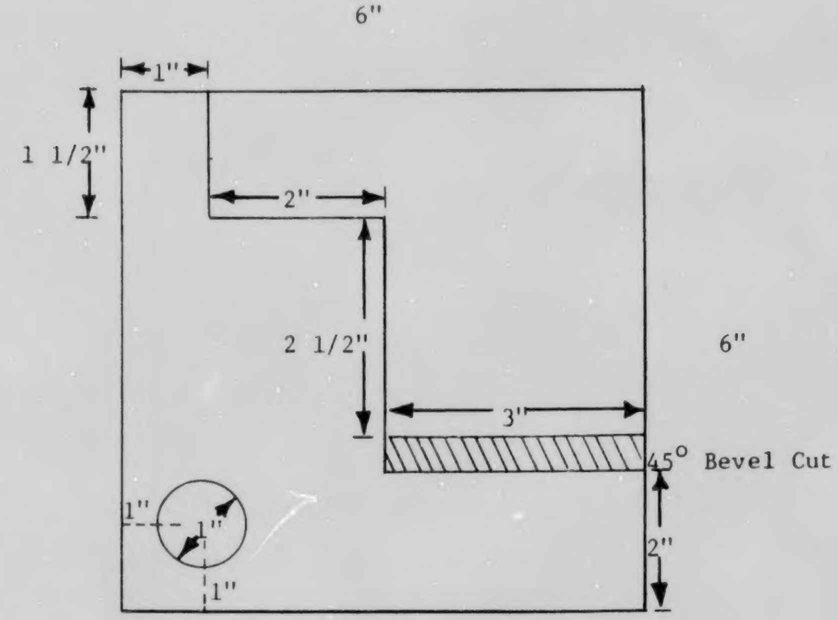
   A. Select starting point

   B. Measure distances and mark

   C. Complete drawing and turn in to instructor for evaluation (Figure 1)

   (NOTE: Instructor may have the students cut out the pattern once it has been approved.)

FIGURE 1



OXYACETYLENE CUTTING
UNIT VIII

JOB SHEET #2--MAKE NINETY DEGREE CUTS ON MILD STEEL AND RESTART A CUT

I. Tools and materials needed

   A. Cutting outfit with tip assembly

   B. Mild steel plate 1/4" to 1/2" thick, 4" wide or wider, 8" long or longer

   C. Soapstone with a sharp point or edge

   D. Straightedge

   E. Gloves

   F. Safety goggles

   G. Pliers

   H. Coveralls

   I. Flint lighter

   J. Welding or cutting table

   K. Slag box

   L. Can of water

   M. Cutting tip

II. Procedure

   A. Mark four parallel lines 2" apart on plate to be cut

   B. Adjust oxygen regulator

   C. Adjust acetylene regulator

   D. Place plate to be cut over slag box

   E. Light torch

   F. Adjust to neutral flame

   G. Assume comfortable position

JOB SHEET #2

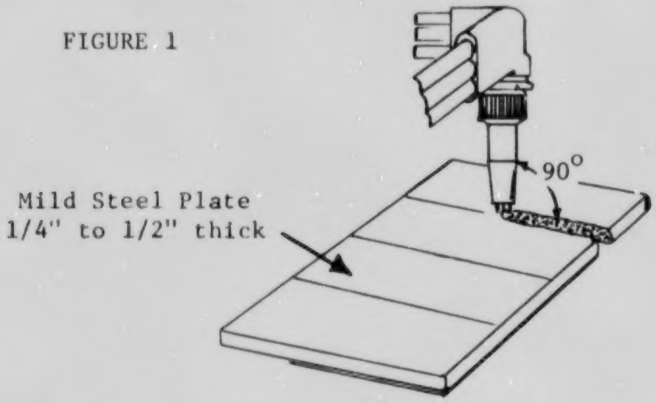
H. Place hoses behind operator

I. Maneuver torch with both hands

J. Hold preheat flame with tip of inner cone 1/16" to 1/8" above top of plate at right edge until red spot appears

K. Depress the oxygen cutting lever, and move from right to left across the plate (for left-handed operators, go from left ro right) (Figure 1)

FIGURE 1



L. Hold the tip at right angles to work while cutting with inner cone being 1/16" to 1/8" above work

M. Make 90° cuts until you have developed the proper procedure

N. Cool metal by placing in can of water with the aid of pliers

O. Show samples to instructor for approval and grading

III. Procedure for restarting a cut

A. Release the oxygen cutting lever

B. Preheat edge (only) where cutting action was stopped

C. Slowly depress oxygen cutting lever and continue cut

OXYACETYLENE CUTTING
UNIT VIII

JOB SHEET #3--MAKE A FLAME BEVELED CUT ON MILD STEEL PLATE

I. Tools and materials needed

   A. Cutting outfit with tip assembly

   B. Mild steel plate 1/4" to 1/2" thick, 4" wide or wider, 8" long or longer

   C. Soapstone with a sharp point or edge

   D. Straightedge

   E. Gloves

   F. Safety goggles

   G. Pliers

   H. Flint lighter

   J. Welding or cutting table

   K. Slag box

   L. Can of water

   M. Cutting tip

II. Procedure

   A. Place one piece of 3/8" to 1/2" plate 2" x 6" on slag box or cutting table

   B. Light and adjust cutting torch to a neutral flame

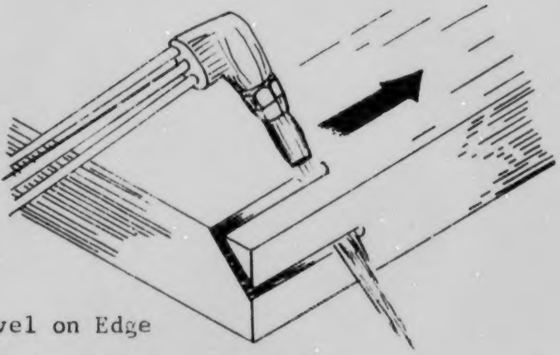
   (NOTE: Oxygen cutting pressures are greater for bevel cuts than 90° cuts.)

   C. Place hoses behind operator

JOB SHEET #3

D. Hold torch with both hands at desired angle to metal as shown (Figure 1)

FIGURE 1



Bevel on Edge

E. Hold preheat flame with tip of inner cone (neutral flame) 1/16" to 1/8" above top of plate until bright red spot appears

F. Depress oxygen cutting lever and proceed across plate with very consistent movement being careful to maintain constant travel speed, torch angle, and flame to work distance

G. Practice until you develop the proper procedure

H. Turn in exercises for instructor's approval and grading

OXYACETYLENE CUTTING
UNIT VIII

JOB SHEET #4--CUT A HOLE IN MILD STEEL

I. Tools and materials needed

  A. Cutting outfit with tip

  B. Mild steel plates

  C. Soapstone with a sharp point or edge

  D. Straightedge

  E. Gloves

  F. Safety goggles

  G. Pliers

  H. Coveralls

  I. Flint lighter

  J. Welding or cutting table

  K. Slag box

  L. Can of water

II. Procedure

  A. Draw two circles on metal

    1. 1" in diameter, 1" from edge

    2. 1/2" in diameter, 1" from edge

  B. Adjust oxygen regulator

  C. Adjust acetylene regulator

  D. Place metal to be cut over slag box

  E. Light torch

  F. Adjust to neutral flame

  G. Assume comfortable position

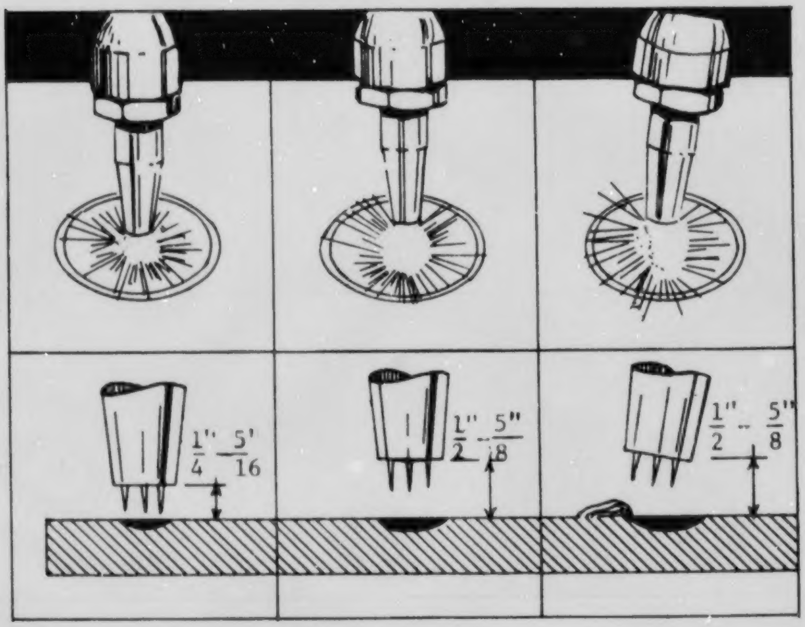
JOB SHEET #4

H. Place hoses behind operator

I. Maneuver torch with both hands

J. Hold tip of inner cone 1/16" to 1/8" above point to be cut until metal turns bright red (Figure 1)

FIGURE 1



1. Tilt torch 15° from vertical position

   (NOTE: This will allow molten metal to be blown away from operator.)

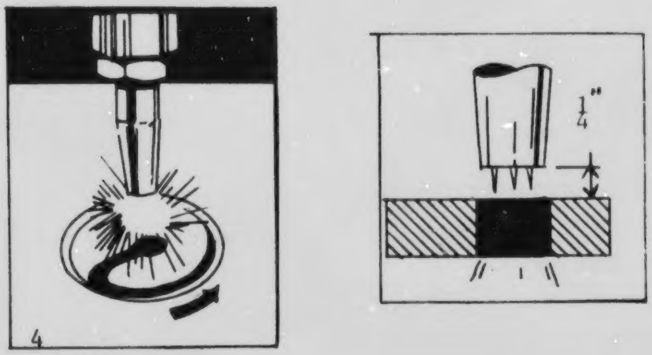
2. Depress oxygen cutting lever slowly moving torch backwards (to the operator's right if right-handed) until cut pierces plate

JOB SHEET #4

K. Return cutting torch to vertical position

1. Raise cutting tip until tip of inner cone is from 1/4" to 1/2" above the plate
2. Make cut (Figure 2)

FIGURE 2



L. Cut just inside soapstone mark until circular cut is completed

M. Repeat steps K and L until all holes are cut

N. Cool metal by placing in can of water with the aid of pliers

O. Show samples to instructor for approval and grading

OXYACETYLENE CUTTING
UNIT VIII

TEST

1. Match terms on the right to the correct definition.

_____a. Metal container with a layer of water or sand to catch hot slag

_____b. Area where the metal was removed in the form of an oxide during the cutting process

_____c. Combining oxygen with another substance

_____d. Fire inside torch

_____e. Refers to the situation in which the most distant portion of the cutting stream lags behind the stream nearest the cutting tip

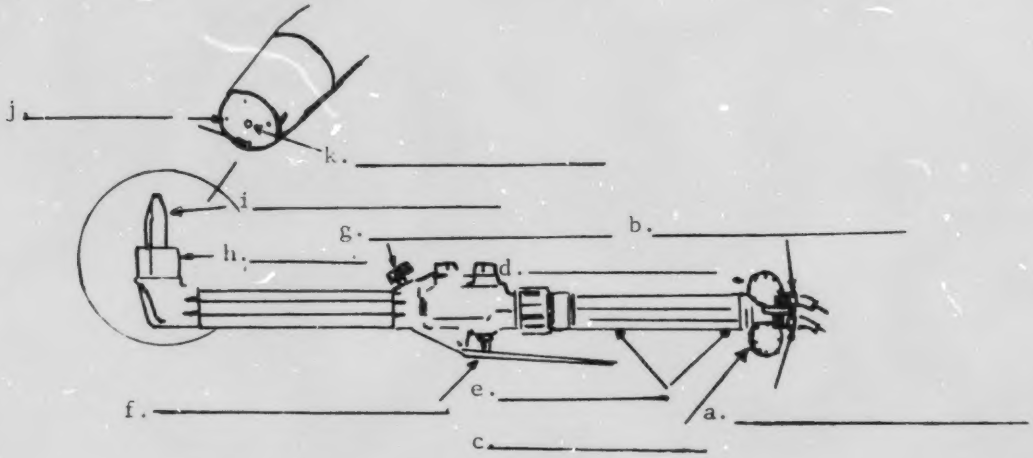
_____f. Momentary burning back of the flame into the tip

_____g. Term usually applied to rust, corrosion, coating, film, or scale

_____h. A process by which iron or steel is heated to a temperature where it can be rapidly oxidized by high purity oxygen flowing under pressure through a cutting torch

1. Flashback
2. Backfire
3. Flame cutting
4. Slag box
5. Drag line
6. Kerf
7. Oxide
8. Oxidation

2. Identify the parts of the torch body and cutting attachment.



3. List the purposes of a slag box.

   a.

   b.

   c.

   d.

4. List five reasons for poor cuts.

   a.

   b.

   c.

   d.

   e.

5. List four causes of a backfire.

   a.

   b.

   c.

   d.

6. Describe the results when a backfire takes place.

7. Describe the results when a flashback takes place.

8. List in the proper order the steps to follow in case of a flashback.

   a.

   b.

   c.

   d.

   e.

   f.

   g.

   h.

9. Demonstrate the ability to:

   a. Lay out a pattern on metal to be cut with the aid of a straightedge and soapstone.

   b. Make 90° cuts on mild steel and restart a cut.

   c. Make a flame beveled cut on mild steel plate.

   d. Cut a hole in mild steel.

   (NOTE: If the above activities have not been accomplished prior to the test, ask the instructor when they should be completed.)

OXYACETYLENE CUTTING
UNIT VIII

ANSWERS TO TEST

1. a. 4
   b. 6
   c. 8
   d. 1
   e. 5
   f. 2
   g. 7
   h. 3
2. a Oxygen fitting
   b. Acetylene fitting
   c. Oxygen torch valve
   d. Acetylene torch valve
   e. Torch body
   f. Oxygen cutting lever
   g. Oxygen preheat valve
   h. Tip nut
   i. Slip-in tip
   j. Preheat orifice
   k. Cutting orifice
3. a. To catch hot slag
   b. To prevent fire
   c. To protect clothing
   d. To protect welding hoses
4. Any five of the following
   a. Preheat flames too small causing cutting speed to be too slow
   b. Preheat flames too long
   c. Oxygen pressure too low

d. Oxygen pressure too high and nozzle size too small

e. Cutting speed too slow

f. Cutting speed too high

g. Blowpipe travel unsteady

h. Cut lost and not carefully restarted

5. Any four of the following

a. Insufficient acetylene or oxygen pressure

b. Loose cutting tip

c. Dirty tip

d. Overheating of cutting tip

e. Bad O-ring in torch body

6. Description should include:

a. Flame burns momentarily back into tip

1. Flame may go out

2. Flame may continue to burn in normal manner

7. Description should include:

a. Fire inside torch

b. Disappearance of flame followed by

1) Squealing or hissing noise inside torch

2) Sparks coming from torch

3) Smoke coming from torch

8. a. Close oxygen preheat valve

b. Close oxygen torch valve

c. Close acetylene torch valve

d. Release oxygen regulator screw

  e. Release acetylene regulator screw

  f. Examine acetylene unit

  g. Reset regulator pressures

  h. Light torch

9. Performance skills will be evaluated to the satisfaction of the instructor.

FASTENERS
UNIT IX

TERMINAL OBJECTIVES

After completion of Unit IX, the student should be able to define fastener and identify various types of fasteners. He should be able to match the use to the various types of fasteners and select the most common sizes of nails. He should also be able to name two coatings used on nails and two materials used to manufacture nails. This knowledge will be evidenced by scoring eighty-five percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Define fastener.
2. Identify the types of nails.
3. Match the use with the various types of nails.
4. Select from a list the lengths of nails most commonly used.
5. Name two coatings for nails.
6. Name two materials used to manufacture nails.
7. Identify five types of screw heads.
8. Identify four types of screws.
9. Select from a list five things to specify when purchasing screws.
10. Identify six types of bolts.
11. Match the use with the various type of bolt.
12. Identify four types of washers.
13. Identify five types of nuts.
14. Identify five types of hinges.
15. Match the use with the various types of hinges.
16. Name two types of glue.

FASTENERS
UNIT IX

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information sheet
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information sheet
6. Give test

(NOTE: Instructors may want to secure nail, screw, and bolt charts from the manufacturing companies for display in the shop.)

Students:

1. Read objectives
2. Study information sheet
3. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objectives
2. Information sheet
3. Transparency masters
    - TM 1--Types of Nails
    - TM 2--Types of Screws
    - TM 3--Types of Bolts
    - TM 4--Types of Washers
    - TM 5--Types of Nuts
    - TM 6--Types of Hinges
4. Test
5. Answers to test

References:

1. Phipps, Lloyd J. Mechanics in Agriculture. Danville, Illinois: Interstate Printers and Publishers, Inc., 1967.

2. Jones, Mack M. Sopwork on the Farm. New York: McGraw-Hill Book Co., 1954.

3. Hardware. Indianapolis, Indiana: The National Retail Hardware Association, 1965.

4. Feirer, John L. Woodworking for Industry. Peoria, Illinois: Charles A. Bennett Co., Inc., 1967.

FASTENERS
UNIT IX

INFORMATION SHEET

I. Fastener--Any device such as a nail, screw, or bolt used to construct or to give stability to an object

II. Types of nails (Transparency 1)

- A. Common
- B. Box
- C. Finishing
- D. Flooring
- E. Shingle
- F. Roofing
- G. Plaster board
- H. Hinge
- I. Wire staple
- J. Lead head
- K. Duplex

III. Types of nails and their use

- A. Common--Used for nailing sheeting, shiplap, and fencing
- B. Box--Used for nailing siding
- C. Finishing--Used for interior finishing, for ceiling, and for cabinet work
- D. Flooring--Used in flooring work
- E. Shingle--Used in nailing shingles
- F. Roofing--Used in nailing rolled roofing and composition shingles
- G. Plaster board--Used in nailing plaster board
- H. Hinge--Used in fastening hinges

I. Duplex--Used in form construction

J. Wire staple--Used in fence construction

K. Lead head--Used in nailing galvanized iron

IV. Lengths of nails

Penney Size	Length In Inches For Common, Box, And Finish
2d	1
3d	1 1/4
4d	1 1/2
4d	1 3/4
*6d	2
7d	2 1/4
*8d	2 1/2
9d	2 3/4
10d	3
12d	3 1/4
*16d	3 1/2
*20d	4
30d	4 1/2
40d	5
50d	5 1/2
60d	6

*Sizes most often used.

(NOTE: A small "d" is used to designate penny.)

V. Coating for nails

A. Cement

B. Galvanized

VI. Materials used to manufacture nails

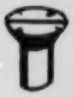
A. Steel

B. Aluminum

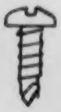
INFORMATION SHEET

VII. Types of screw heads

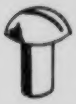
A. Flat head



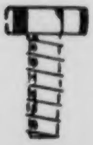
D. Pan head



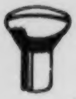
B. Round head



E. Hex head



C. Oval head



VIII. Types of screws (Transparency 2)

A. Lag--Used in fastening wood to brick or concrete

B. Flat head--Used for strength in wood work (usually countersunk)

C. Oval head--Used in cabinet work and for attaching hinges

D. Round head--Used for flush mounting wood

E. Phillips--Usually used in the auto industry

IX. Specification required when purchasing screws

A. Amount

B. Length

C. Size

D. Quantity

E. Type of head

F. Finish

G. Use

INFORMATION SHEET

X. Types of bolts (Transparency 3)

   A. Machine

   B. Carriage

   C. Stove

   D. Plow

   E. Toggle

   F. Expansion

   (NOTE: The following are special made bolts designed for a specific purpose.)

      1. U-bolt

      2. Eye bolt

      3. Hook bolt

      4. Turnbuckle

XI. Types of bolts and their use

   A. Machine--Used in assembling machinery

   B. Carriage--Used in fastening wood and other soft materials

   C. Round head stove--Used in sheet metal work

   D. Flat head stove--Used in sheet metal work

   E. Plow--Used in assembling machinery

   F. Toggle--Used in fastening objects to hollow walls

   G. Expansion--Used in fastening material to concrete walls, floors, etc.

XII. Types of washers (Transparency 4)

   A. Plain (flat)

   B. Lock

      1. Common

      2. External

INFORMATION SHEET

3. Internal
4. Internal-External
5. Countersunk

XIII. Types of nuts (Transparency 5)

A. Square
B. Hexagon
C. Cap (Acorn)
D. Jam or lock
E. Castle
F. Wing

XIV. Types of hinges (Transparency 6)

A. Strap
B. T
C. Butt
D. Screw hook and strap
E. Cabinet
F. Hasp

XV. Types of hinges and their use

A. Strap--Used in heavy construction
B. T--Used when butt end is fastened into a studding
C. Butt--Used in cabinet work
D. Screw hook and strap--Used in hinging gates
E. Cabinet--Used in cabinet work
F. Hasp--Used in fastening doors and provides a place for a lock

INFORMATION SHEET

XVI. Types of glue

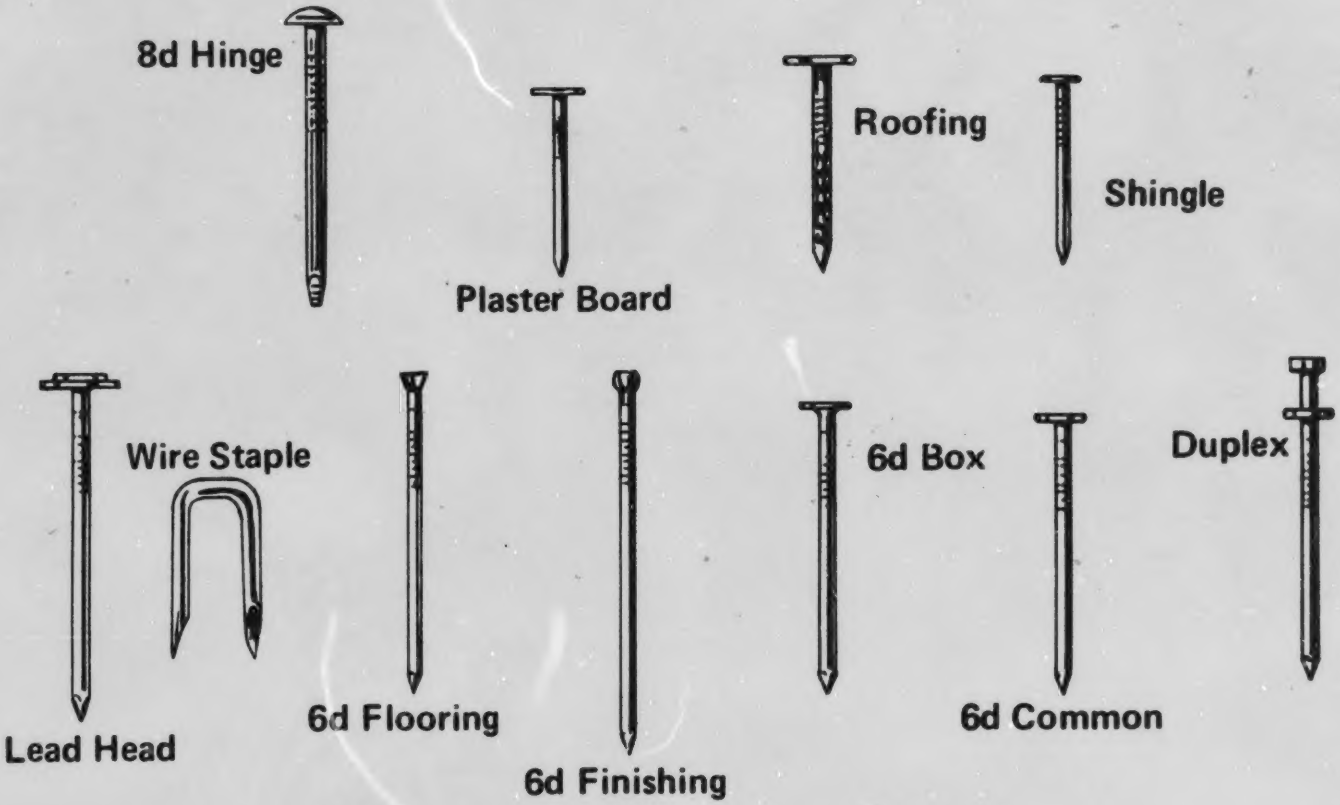
A. Casein (white glue)

(NOTE: Casein is resistant to heat, cold, and moisture, but is not recommended for exterior use.)

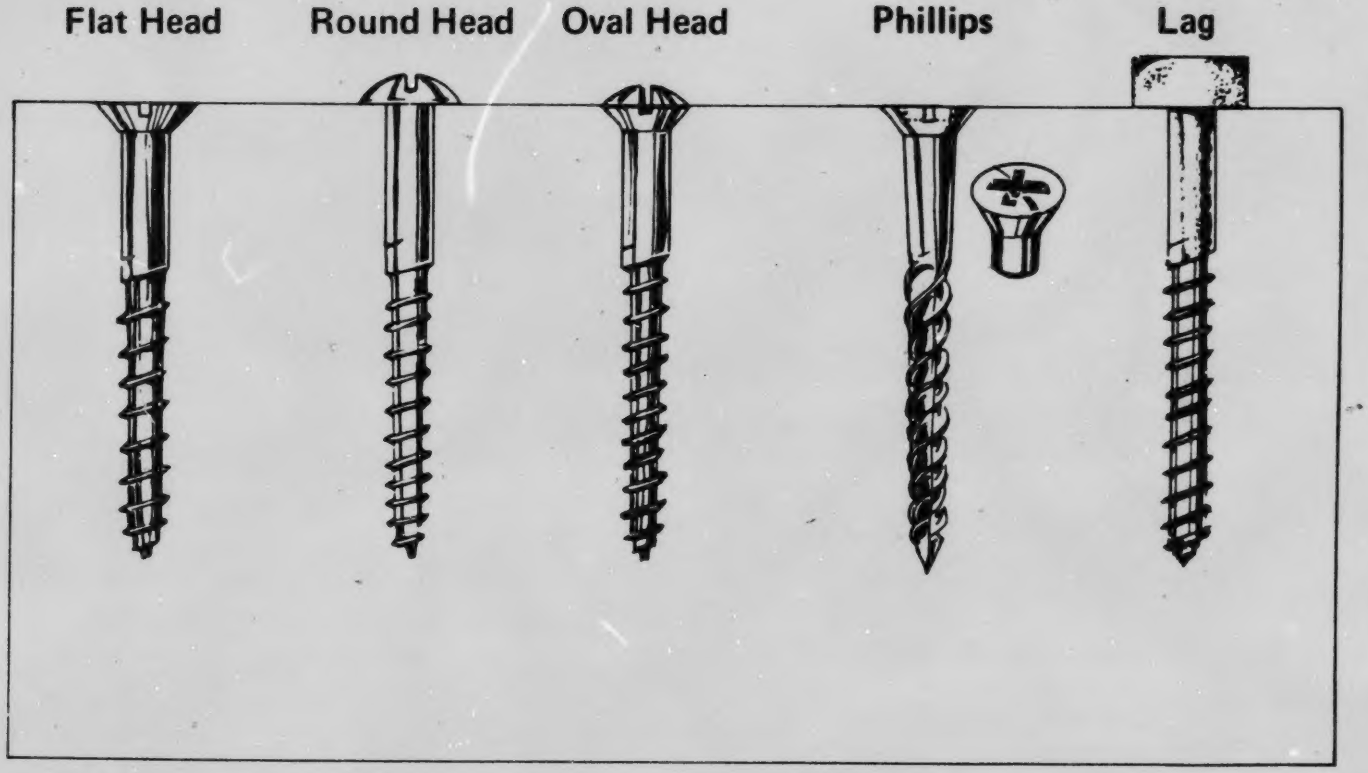
B. Resorcinal resin

(NOTE: Resorcinal resin is recommended for exterior and interior use as it is resistant to exposure to weather.)

Types of Nails


8d Hinge
Plaster Board
Roofing
Shingle
Lead Head
Wire Staple
6d Flooring
6d Finishing
6d Box
6d Common
Duplex

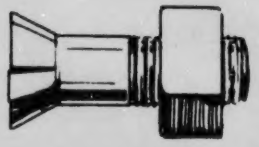
Types of Screws


Flat Head
Round Head
Oval Head
Phillips
Lag

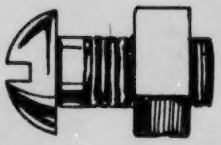
TM 2

Ag. I - 279-F

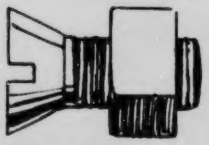
Types of Bolts



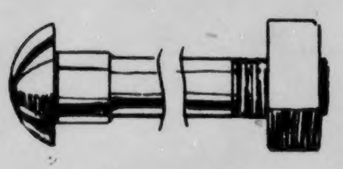
Plow



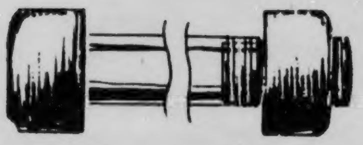
Round
Head Stove



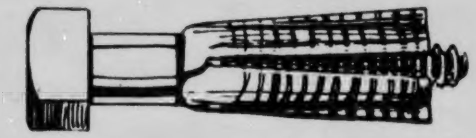
Flat Head Stove



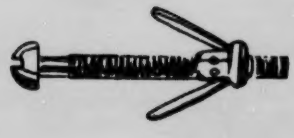
Carriage



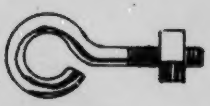
Machine



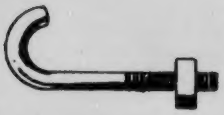
Expansion



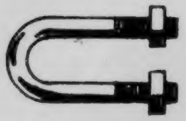
Toggle



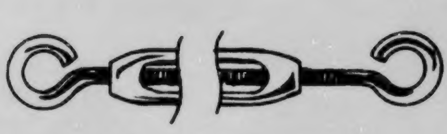
Eye Bolt



Hook Bolt

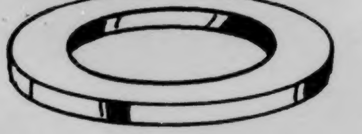


U Bolt

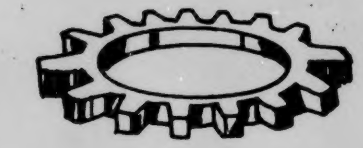


Turnbuckle

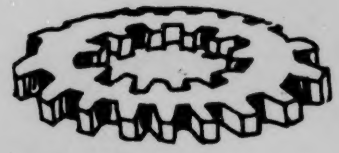
Types of Washers



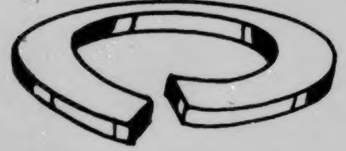
Plain Flat Washer



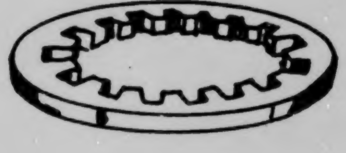
Lock Washer
External



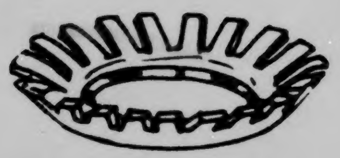
Lock Washer
Internal-External



Common
Lock Washer

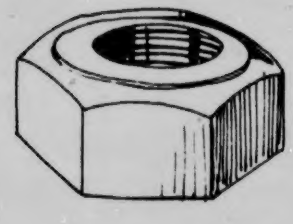


Lock Washer
Internal

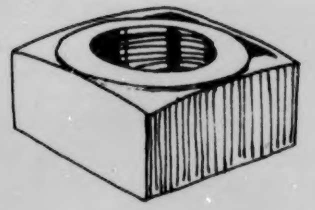


Lock Washer
Countersunk

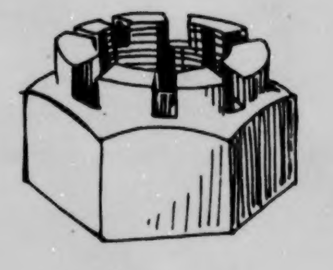
Types of Nuts



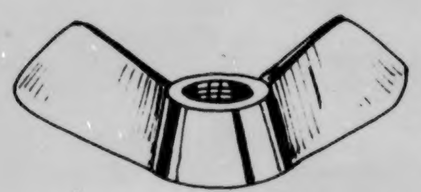
Hexagon



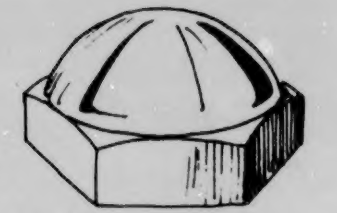
Square



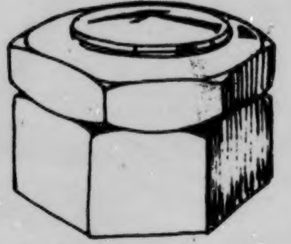
Castle Nut



Wing Nut

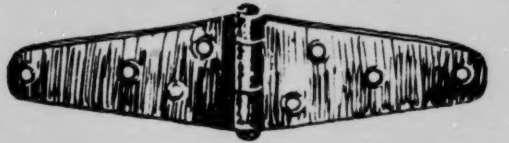


Acorn or Cap Nut

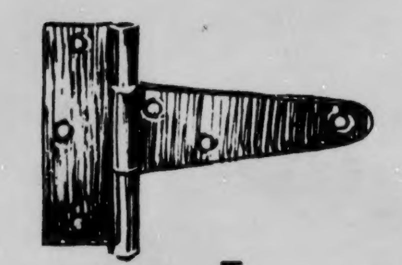


Jam or
Lock Nut

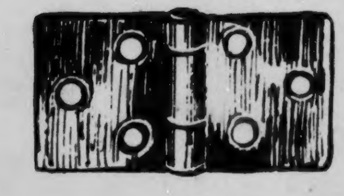
Types of Hinges



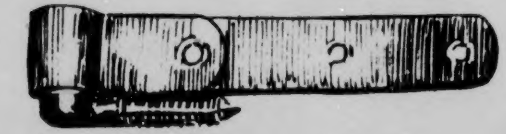
Strap



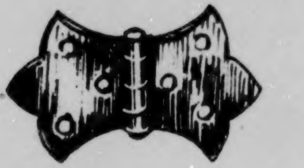
T



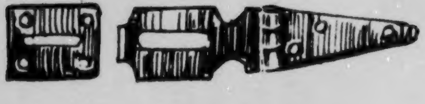
Butt



Screw Hook and Strap



Cabinet



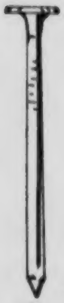
Hasp

FASTENERS
UNIT IX

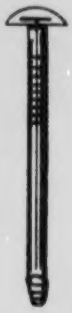
TEST

1. Define fastener.

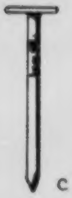
2. Identify the following types of nails.



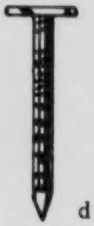
a. ____________________



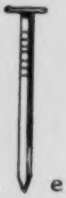
b. ____________________



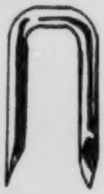
c. ____________________



d. ____________________



e. ____________________



f. ____________________

3. Match the types of nails on the right to the correct use.

_____a. Used for interior finishing, for ceiling, and for cabinet work

_____b. Used in nailing shingles

_____c. Used in nailing plaster board

_____d. Used in form construction

_____e. Used in nailing galvanized iron

_____f. Used for nailing sheeting, shiplap, and fencing

_____g. Used for nailing siding

_____h. Used in flooring work

_____i. Used in nailing rolled roofing and composition shingles

_____j. Used in fastening hinges

_____k. Used in fence construction

1. Common
2. Box
3. Shingle
4. Roofing
5. Wire staple
6. Flooring
7. Plaster board
8. Hinge
9. Duplex
10. Lead head
11. Finishing

4. Select from the list the lengths of nails most commonly used by placing an "X" in the blanks provided.

_____a. 2d
_____b. 3d
_____c. 4d
_____d. 5d
_____e. 6d
_____f. 7d
_____g. 8d

_____h. 10d
_____i. 12d
_____j. 16d
_____k. 20d
_____l. 30d
_____m. 40d
_____n. 60d

5. Name two coatings for nails.

a.

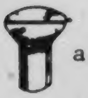
b.

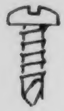
6. Name two materials used to manufacture nails.

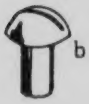
a.

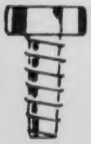
b.

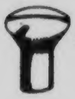
7. Identify the following types of screw heads.


a. ____________________

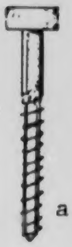

d. ____________________

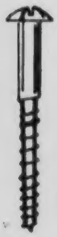

b. ____________________


e. ____________________


c. ____________________

8. Identify the following types of screws.


a. ____________________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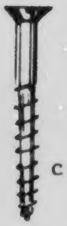
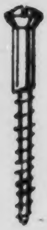

c. ____________________


d. ____________________

9. Select from the list five things to specify when purchasing screws by placing an "X" in the blank.

_____a. Length

_____b. Color

_____c. Size

_____d. Quantity

_____e. Quality

_____g. Type of head

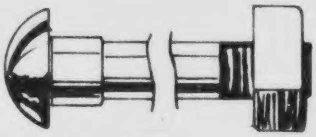
_____h. Water proof

_____i. Finish

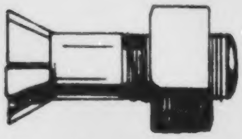
_____j. Type of thread

_____k. Penny weight

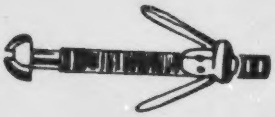
10. Identify the following types of bolts.



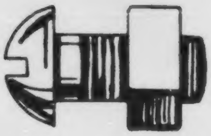
a. ______________________________



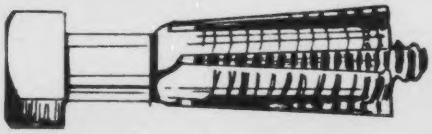
b. ______________________________



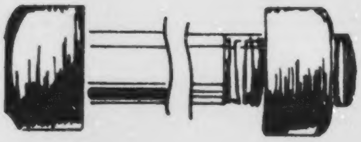
c. ______________________________



d. ______________________________



e. ______________________________



f. ______________________________

11. Match the types of bolts on the right to the correct use.

(NOTE: Bolts may be used more than once.)

_____a. Used in assembling machinery

_____b. Used in fastening wood and other soft materials

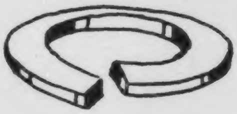
_____c. Used in sheet metal work

_____d. Used in fastening objects to hollow walls

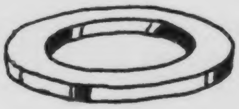
_____e. Used in fastening materials to concrete walls, floors, etc.

1. Machine
2. Carriage
3. Stove
4. Plow
5. Toggle
6. Expansion

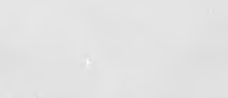
12. Identify the following types of washers.



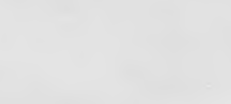
a. ____________



b. ____________

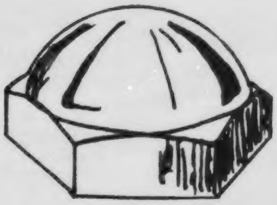


c. ____________

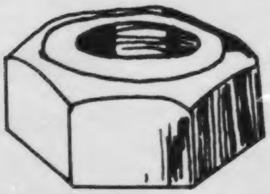


d. ____________

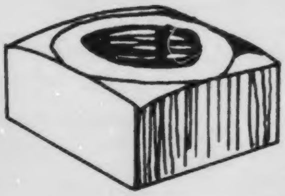
13. Identify the following types of nuts.



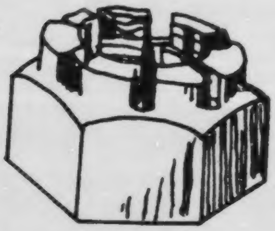
a. ____________



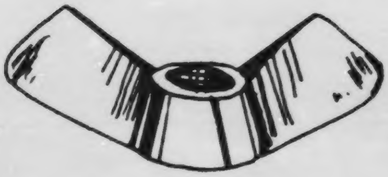
b. ____________



c. ____________

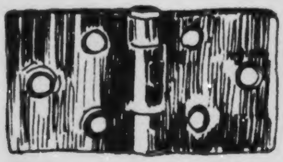


d. ____________

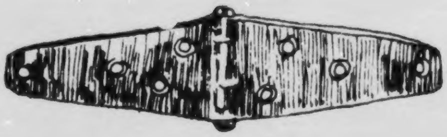


e. ____________

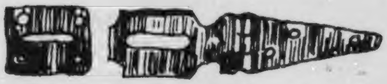
14. Identify the following types of hinges.



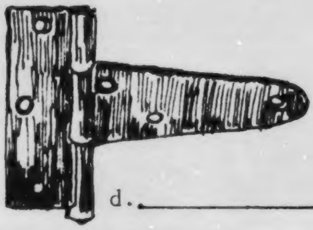
a. ________________



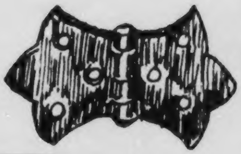
b. ________________



c. ________________



d. ________________



e. ________________

15. Match the hinge on the right with description of its use.

(NOTE: Some hinges may be used more than once.)

_____a. Used when butt end is fastened into a studding

_____b. Used in hinging gates

_____c. Used in fastening doors and provides a place for a lock

_____d. Used in heavy construction

_____e. Used in cabinet work

1. Strap
2. T
3. Butt
4. Screw book and strap
5. Cabinet
6. Hasp

16. Name two types of glue.

a.

b.

FASTENERS
UNIT IX

ANSWERS TO TEST

1. Any device such as a nail, screw, or bolt used to construct or to give stability to an object

2. a. Box

   b. Hinge

   c. Plaster board

   d. Roofing

   e. Shingle

   f. Wire staple

3. a. 11

   b. 3

   c. 7

   d. 9

   e. 10

   f. 1

   g. 2

   h. 6

   i. 4

   j. 8

   k. 5

4. e,g,j,k

5. a. Cement

   b. Galvanized

6. a. Steel

   b. Aluminum

7. a. Flat

   b. Round

   c. Oval

   d. Pan

   e. Hex

8. a. Lag
   b. Round head
   c. Flat head
   d. Oval head
9. a,c,d,g,i
10. a. Carriage
    b. Plow
    c. Toggle
    d. Stove
    e. Expansion
    f. Machine
11. a. 1,4
    b. 2
    c. 3
    d. 5
    e. 6
12. a. Lock
    b. Plain (flat)
    c. External lock
    d. Internal-External lock
13. a. Cap
    b. Hexagon
    c. Square
    d. Castle
    e. Wing
14. a. Butt
    b. Strap

c. Hasp

d. T

e. Cabinet

15. a. 2

b. 4

c. 6

d. 1

e. 3,5

16. a. Casein (white glue)

b. Resorcinal resin

FARM SAFETY
UNIT X

TERMINAL OBJECTIVES

After completion of Unit X the student should be able to list safety rules to observe when operating a tractor and other farm machinery. He should be able to define terms and name the major cause of accidents. He should also be able to state rules of safety around home and farm buildings and around livestock. This knowledge will be evidenced by scoring ninety percent on a unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with farm safety to the correct definition.
2. Name the major cause of accidents.
3. List the three steps of accident prevention.
4. State the number of accidents in all industries as compared to agriculture.
5. Name three general home and building safety practices.
6. State four safety rules to observe when working around livestock.
7. Name three ways tractors upset.
8. State three precautions that can reduce tractor upsets.
9. Write five precautions that should be observed when operating a tractor.
10. List five safety rules to follow to reduce falls from tractors.
11. List three safety measures to observe when refueling a tractor.
12. List five safety precautions to be observed in the safe operation of farm machinery.
13. List characteristics of a safe tractor operator.
14. Draw a slow moving vehicle emblem.
15. Name four provisions under which a 14 to 15 year old can operate a farm tractor.

FARM SAFETY
UNIT X

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information sheet
3. Make transparencies
4. Discuss terminal and specific objectives
5. Discuss information sheet
6. Give test

(NOTE: Instructors may want to secure safety films from the National Safety Council to show to class. There are many good films available. The instructor may also want to take the class to a machinery dealer to see some of the equipment. Also, a driving course may be set up for practice.)

Student:

1. Read objective sheet
2. Study information sheet
3. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objective sheet
2. Information sheet
3. Transparency masters
    - TM 1--Accidents - Farm Population
    - TM 2--Safe Tractor Operation
    - TM 3--Safe Operation
    - TM 4--Slow Moving Vehicle Emblem (SMV)
4. Test
5. Answers to test

References:

1. Shepp, Neil O. Vocational Agriculture Training Programs: Safe Tractor Operation and Safe Farm Machinery Operation. East Lansing, Michigan: Rural Manpower Center, Michigan State University, 1970.

2. Tractor Operation and Daily Care. Athens, Georgia: American Association of Vocational Instructional Materials, 1967.

3. Farm Tractors. Chicago, Illinois: American Oil Co., 1964.

4. Instructional Materials for Vocational Agriculture I. College Station, Texas: Teaching Materials Center, Agricultural Education Department, Texas A & M University.

5. Machinery Care and Safety. Chicago, Illinois: 4-H Tractor Program, National 4-H Service Committee, 1963.

FARM SAFETY
UNIT X

INFORMATION SHEET

I. Terms and definitions

   A. Accident--That occurrence in a sequence of events which usually produces intended injury or property damage

   B. Safety--The condition of being safe from undergoing or causing harm, injury, or loss

   C. Hazard--A source of danger

II. Major cause of accidents--Carelessness

III. Steps of accident prevention

   A. See the hazard

   (NOTE: One should think about what is going to happen or what might happen as far ahead of encountering the situation as possible.)

   B. Know the defense

   (NOTE: There are specific ways of handling specific situations. Learn them and learn them well so you can apply them.)

   C. Act in time

   (NOTE: Once you have seen the hazard and you select the defense against it, act. Never take a "wait and see" attitude.)

IV. Number of accidents in all industries as compared to agriculture (Transparency 1)

   A. 2,000,000 accidents a year in all industries

   B. 290,000 accidents a year in agriculture

   (NOTE: Agriculture leads all industries with the largest number of deaths and injuries due to accidents.)

V. General home and building safety practices

   A. Remove all fire hazards

   B. Provide fire extinguishers for all parts of the farm

   C. Eliminate rats, mice, and insects if possible

   D. Store tools and equipment in appropriate places

INFORMATION SHEET

E. Check farm wiring for electrical hazards

F. Do not operate internal combustion engines in a closed building or room

VI. Safety in working with and handling livestock

A. Approach animals carefully

B. Treat bulls, stallions, rams and boars as potential hazards

C. Remove nails and broken boards from fences and corrals

D. Try to prevent livestock losses by careful supervision

E. Load and haul animals carefully to avoid injury

F. Vaccinate livestock to avoid disease

VII. Three ways tractors may upset

A. Sideways

B. Backward

C. Frontward

VIII. Precautions that can reduce tractor upset

A. Set wheels wide as practical for the job

B. Add front or rear weights to properly balance tractor

C. Hitch only to drawbar, set no higher than 18" or to specific hitch points

D. Lower loader bucket when traveling and before dismounting

E. Run and maintain tractor according to operator's manual

IX. Precautions for operating tractors (Transparency 2)

A. Slow down when making turns

B. Adjust brakes so that the same pedal travel will give equal braking on both wheels

C. Do not rest your foot on the clutch after it is engaged

D. Leave tractor in gear when going downhill

E. Do not attempt to change gears in motion if your tractor has a hand shift transmission

INFORMATION SHEET

- F. Provide for night operation of equipment
    - 1. On tractor
        - a. Two head lamps
        - b. One tail lamp
        - c. Flashing warning lamp is highly practical
    - 2. On towed or mounted equipment
    - 3. On projecting parts of equipment
- G. Do not drive close to the edge of ditches or banks
- H. Do not ride on the tractor drawbar
- I. Do not allow passengers on the tractor
- J. Attach all towed equipment to the drawbar
- K. Use a close hitch for all jobs if possible
- L. Let the drawbar swing freely on heavy loads
- M. When stuck in mud, back out if possible or pull with another tractor
- N. When operating on the highway
    - 1. Provide safety warning devices, such as a slow moving vehicle (SMV) emblem (Transparency 3)
    - 2. Use the highway right-of-way
- O. Others that may be added by the instructor

X. Safety rules to reduce falls from tractors

- A. Do not allow additional riders
- B. Use hand and foot aids provided when mounting or dismounting
- C. Step on or off a tractor only when it is stopped
- D. Keep operator's platform clear
- E. Avoid riding on fender and drawbar
- F. Slow down when crossing rough ground
- G. Keep alert for low hanging overhead obstructions

INFORMATION SHEET

XI. Safety measures to observe when refueling

- A. Turn the tractor off
- B. Check against fire hazards
- C. Let tractor engine cool
- D. Do not fill tank completely full
- E. Replace fuel cap tightly
- F. Do not smoke when refueling
- G. Check daily for leaks

XII. Safety precautions in safe operation of farm machinery

- A. Turn off machine before working on it or making adjustments
- B. Always keep all shields in place
- C. Dress appropriately and do not work when fatigued
- D. Set the brakes when you leave the tractor
- E. Keep all equipment in proper adjustment
- F. Do not use a stick to unclog a machine when it is running
- G. Be careful of others
- H. Never attempt to operate a machine unless you know how
- I. Anchor belt-driven equipment securely
- J. Line the tractor pulley, belt, and machine pulley
- K. Keep PTO, gear and belt shields in place

XIII. Characteristics of a safe tractor operator (Transparency 3)

- A. Must have knowledge

  (NOTE: This includes how to recognize hazards and how to protect one's self as well as experience and training.)

- B. Must be alert
- C. Must have foresight
- D. Must be able to make judgement
- E. Must have skill

INFORMATION SHEET

XIV. Slow-moving-vehicle sign (Transparency 4)

XV. Provisions under which 14 or 15 year olds can operate a farm tractor

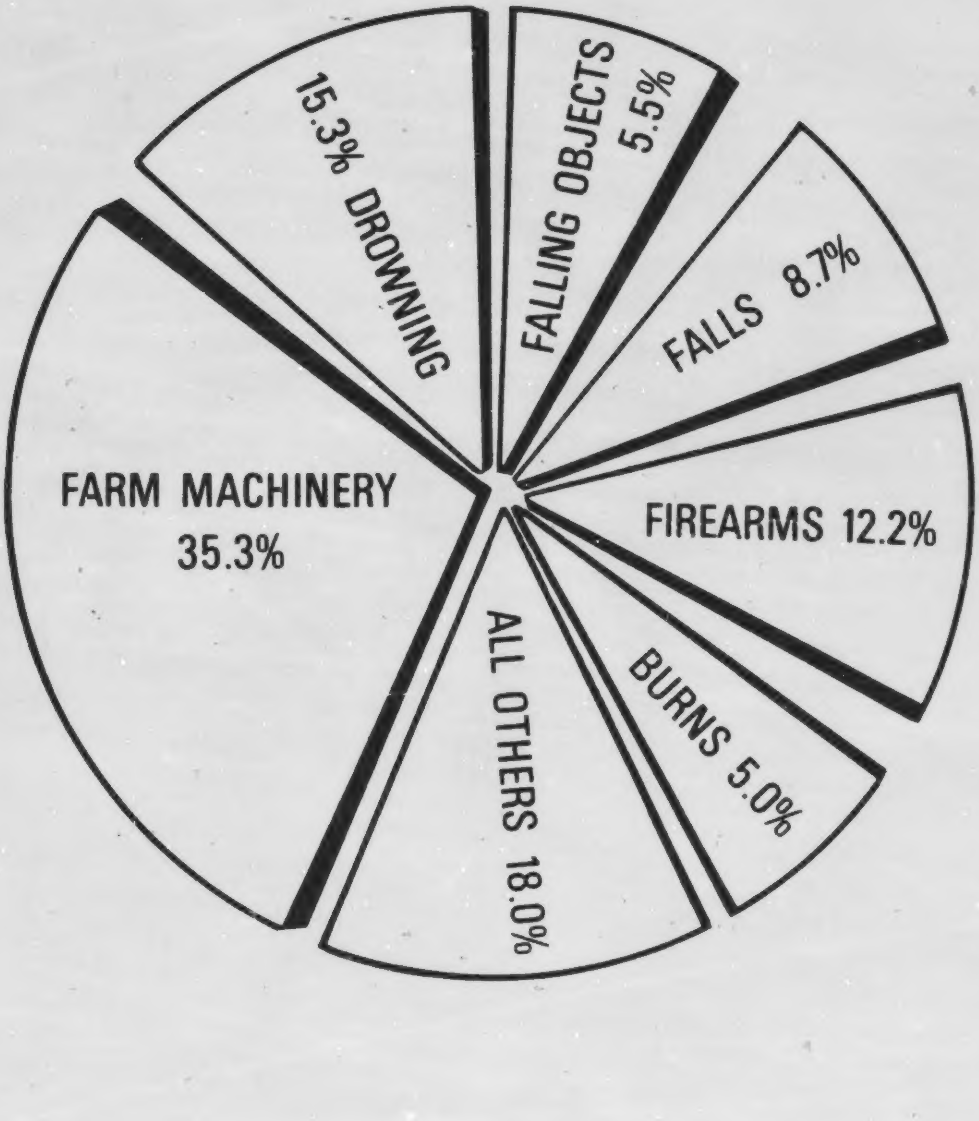
A. Operating for his parents

B. Has completed 15 hours of safety instruction and received a certificate to this effect

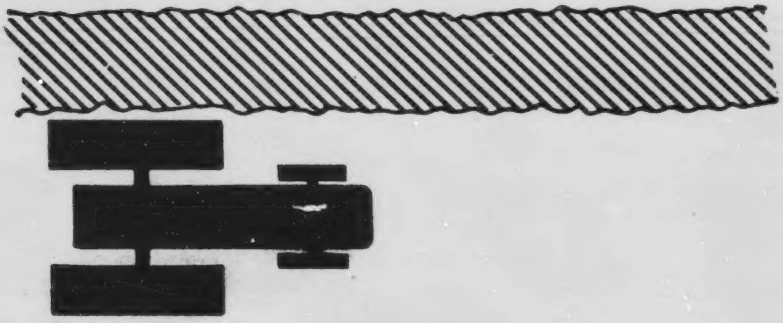
C. Operation of the tractor is part of his supervised work experience in Vo-Ag

D. Operation of the tractor is part of his 4-H project

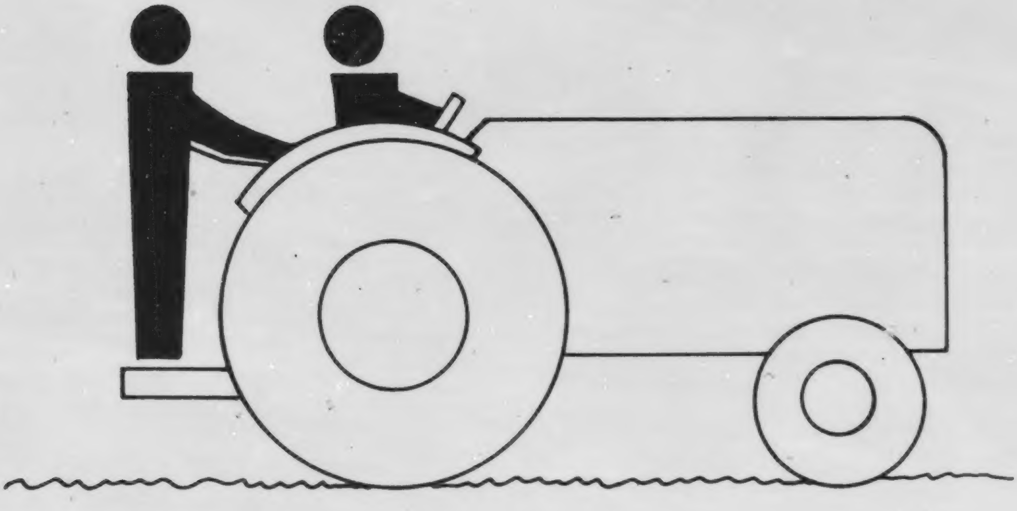
Accidents – Farm Population



Safe Tractor Operation

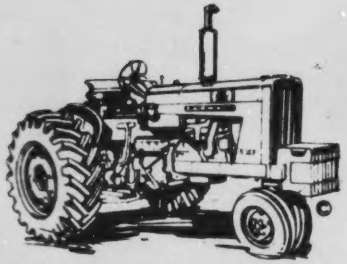


Do Not Drive Close to the Edge of Ditches or Banks

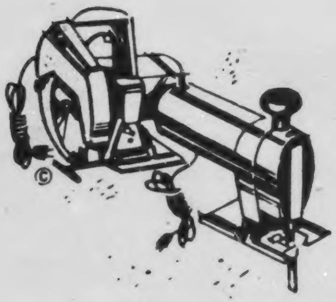


Do Not Ride the Tractor Drawbar and
Do Not Allow Passengers on the Tractor

Safe Operation



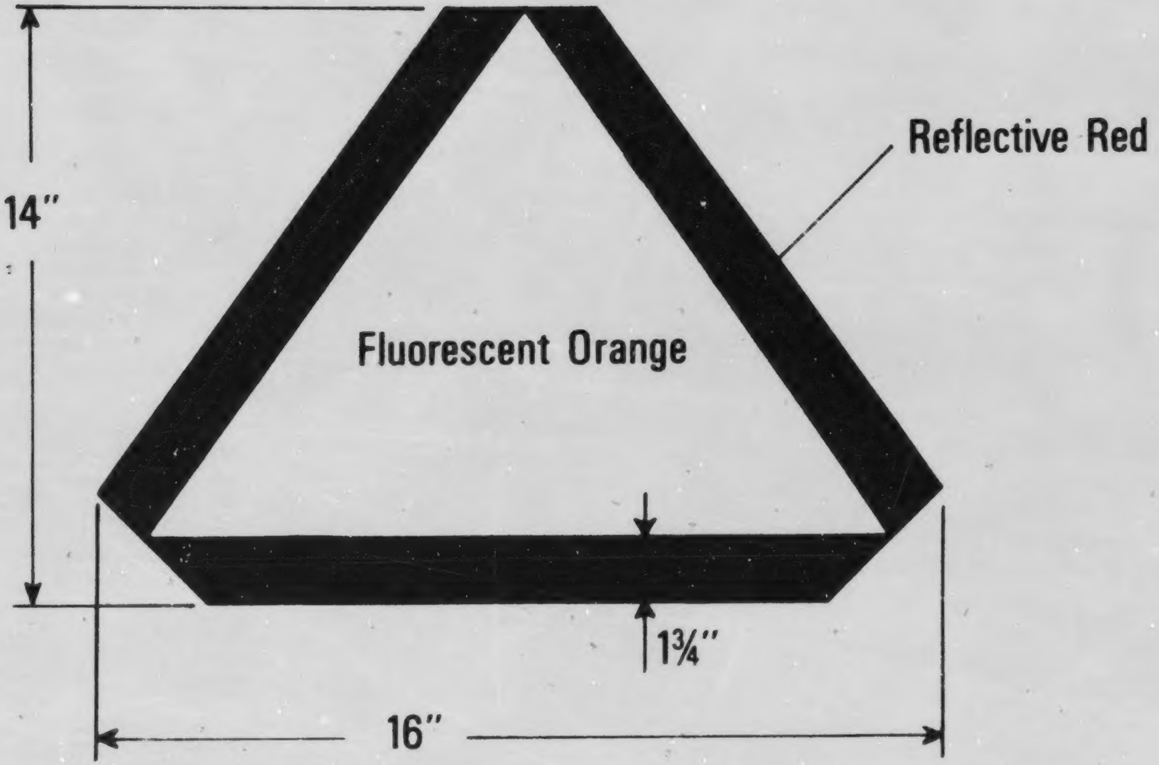
- Knowledge
- Alertness
- Foresight
- Judgement
- Skill



TM 3

Ag. I - 321-F

Slow Moving Vehicle Emblem
SMV


14"
Reflective Red
Fluorescent Orange
1¾"
16"

FARM SAFETY
UNIT X

TEST

1. Match the terms on the right to the correct definition.

   _____a. A source of danger

   _____b. That occurrence in a sequence of events which usually produces unintended injury or property damage

   _____c. The condition of being safe from undergoing or causing harm, injury, or loss

   1. Accident
   2. Safety
   3. Hazard

2. Name the major cause of accidents.

3. List three steps of accident prevention.

   a.

   b.

   c.

4. State the number of accidents in all industries as compared to agriculture.

   a. All industries__________

   b. Agriculture_____________

5. Name three general home and building safety practices.

   a.

   b.

   c.

6. State four safety rules to observe when working around livestock.

   a.

   b.

   c.

   d.

7. Name three ways tractors upset.

   a.

   b.

   c.

8. State three precautions that can reduce tractor upsets.

   a.

   b.

   c.

9. Write five precautions that should be observed when operating a tractor.

   a.

   b.

   c.

   d.

   e.

10. List five safety rules to follow to reduce falls from tractors.

    a.

    b.

    c.

    d.

    e.

11. List three safety precautions to observe when refueling a tractor.

    a.

    b.

    c.

12. List five safety precautions to be observed in the safe operation of farm machinery.

    a.

    b.

c.

d.

e.

13. List characteristics of a safe tractor operator.

a.

b.

c.

d.

e.

14. Draw a slow moving vehicle emblem.

15. List four provisions under which a 14 or 15 year old can operate a farm tractor.

a.

b.

c.

d.

FARM SAFETY
UNIT X

ANSWERS TO TEST

1. a. 3
   b.
   b. 1
   c. 2

2. Carelessness

3. a. See the hazard
   b. Know the defense
   c. Act in time

4. a. 2,000,000
   b. 290,000

5. Any three of the following
   a. Remove all fire hazards
   b. Provide fire extinguisher for all parts of the farm
   c. Eliminate rats, mice, and insects if possible
   d. Store tools, guns, and equipment in appropriate places
   e. Check farm wiring for electrical hazards
   f. Do not operate internal combustion engines in a closed building or room

6. Any four of the following
   a. Approach animals carefully
   b. Treat bulls, stallions, and rams as potential hazards
   c. Remove nails and broken boards from fences and corrals
   d. Try to prevent livestock losses by careful supervision
   e. Load and haul animals carefully to avoid injury
   f. Vaccinate livestock to avoid disease

7. a. Sideways
   b. Backward
   c. Frontward

8. Any three of the following
    - a. Set wheels wide as practical for the job
    - b. Add front or rear weights to properly balance tractor
    - c. Hitch only to drawbar set no higher 18" or to specific hitch points
    - d. Lower loader bucket when traveling and before dismounting
    - e. Run and maintain tractor according to operator's manual
9. Any five of the following
    - a. Slow down when making turns
    - b. Adjust brakes so that the same pedal travel will give equal braking on both wheels
    - c. Do not rest your foot on the clutch after it is engaged
    - d. Leave the tractor in gear when going downhill
    - e. Do not attempt to change gears in motion if your tractor has a hand shift transmission
    - f. Provide for night operation of equipment
    - g. Do not drive close to the edge of ditches or banks
    - h. Do not ride on tractor drawbar
    - i. Do not allow passengers on the tractor
    - j. Attach all towed equipment to the drawbar
    - k. Use a close hitch for all jobs if possible
    - l. Let the drawbar swing freely on heavy loads
    - m. When stuck in mud, back out if possible or pull with another tractor
    - n. When operating on the highway
        - 1) Provide safety warning devices
        - 2) Use the highway right-of-way
    - o. Others may be added by the instructor
10. Any five of the following
    - a. Do not allow additional riders

b. Use hand and foot aids provided when mounting or dismounting

c. Step on or off a tractor only when it is stopped

d. Keep operator's platform clean

e. Avoid riding on fenders and drawbar

f. Slow down when crossing rough ground

g. Keep alert for low hanging overhead obstructions

11. Any three of the following

a. Turn the tractor off

b. Check against fire hazards

c. Let tractor engine cool

d. Do not fill tank completely full

e. Replace fuel cap tightly

f. Do not smoke when refueling

g. Check daily for leaks

12. Any five of the following

a. Turn off machine before working on it or making adjustments

b. Always keep all shields in place

c. Dress appropriately and do not work when fatigued

d. Set the brakes when you leave the tractor

e. Keep all equipment in proper adjustment

f. Do not use a stick to unclog a machine when it is running

g. Be careful of others

h. Never attempt to operate a machine unless you know how

i. Anchor belt-driven equipment securely

j. Line the tractor pulley, belt, and machine pulley

k. Keep PTO, gear and belt shields in place

13. a. Must have knowledge

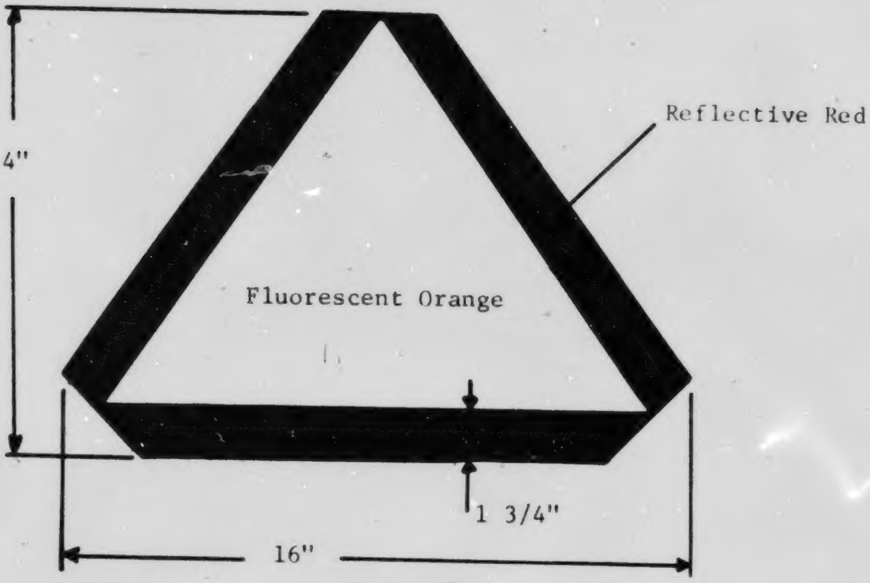
b. Must be alert

c. Must have foresight

d. Must be able to make judgement

e. Must have skill

14.


14"
Reflective Red
Fluorescent Orange
1 3/4"
16"

15. a. Operating for his parents

b. Has completed 15 hours of safety instruction and received a certificate to this effect

c. Operation of the tractor is part of his supervised work experience in Vo-Ag

d. Operation of the tractor is part of his 4-H project

IDENTIFICATION AND SAFE USE OF POWER TOOLS
UNIT XI

TERMINAL OBJECTIVES

After the completion of Unit XI, the student should be able to match terms associated with power tools. He should be able to identify and demonstrate the safe use of selected power tools. This knowledge will be evidenced through demonstration and by scoring eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms associated with power tools when given the proper definition.
2. Name the selected power tools and the uses of each.
3. Identify the selected power tools.
4. Identify the principal parts of the selected power tools.
5. List the safety rules concerning the use of selected power tools.
6. Demonstrate the ability to use and adjust the selected power tools.

IDENTIFICATION AND SAFE USE OF POWER TOOLS
UNIT XI

SUGGESTED ACTIVITIES

Instructor:

1. Provide students with objective sheet
2. Provide students with information sheet
3. Make transparencies
4. Discuss terminal and specific objectives with students
5. Discuss information sheets with students
6. Demonstrate procedures for completing job sheets
7. May add other power tools if needed
8. Give test

Student:

1. Read objective sheet
2. Study information sheet
3. Demonstrate procedures for completing procedures outlined in job sheets
4. Take test

INSTRUCTIONAL MATERIALS

Included in this unit:

1. Objective sheet
2. Information sheet
3. Transparency masters
    - TM 1--Ripping and Crosscutting
    - TM 2--Drill Press
    - TM 3--Portable Electric Saw
    - TM 4--Pedestal (Power) Grinder
    - TM 5--Power Hawksaws
    - TM 6--Wood Bits
    - TM 7--Drilling Metal
4. Job sheets
    - Job Sheet #1 - Drill Press
    - Job Sheet #2 - Portable Electric Saw
    - Job Sheet #3 - Metal Band Saw
5. Test
6. Answers to test

References

1. Agricultural Education Teaching Materials Center, Texas A&M University, College Station Texas, VA 1, Basic V.A. II.

2. Jones, Mack M., Shopwork on the Farm, McGraw-Hill Book Company, New York, New York.

INDENTIFICATION AND SAFE USE OF POWER TOOLS
UNIT XI

INFORMATION SHEET

I. Terms and definitions

  A. Guard - Safety device for protecting the operator

  B. Table - Usually tilting, can be moved up or down the column and locked at any position

  C. Clamp - Locking device

  D. Stock - Material to be worked on

  E. V-Block - A tool for holding round stock

  F. Feed - Rate at which stock is drilled, cut or ground

  G. Ripping - Cutting wood along or with the grain (Transparency 1)

  H. Crosscutting - Cutting wood against the grain (Transparency 1)

  I. Bevel - Cutting on an angle

II. Selected power tools and their uses

  A. Drill Press - used to drill holes in wood and metal

  B. Portable Electric Saw - used for ripping and crosscutting of wood

  C. Power Grinder - used to smooth metal, sharpen tools, and remove small amounts of metal from a surface

  D. Power Hack Saw or Metal Band Saw - used for cutting various types of metals at any desired angle quickly

III. Identification of Power Tools

  A. Drill Press (Transparency 2)

  B. Portable Electric Saw (Transparency 3)

  C. Pedestal (Power) Grinder (Transparency 4)

  D. Power Hack Saw or Metal Band Saw (Transparency 5)

IV. Principle Parts

  A. Drill press (Transparency 2)

INFORMATION SHEET

    1. Geared chuck
    2. Table
    3. Column
    4. Feed lever
    5. Table clamp
    6. Motor
    7. Guard
    8. Quill & quill lock
    9. Depth pointer and stop
    10. Base
    11. Drill bits - (Transparencies 6 and 7)

B. Portable Electric Saw (Transparency 3)

    1. Handle
    2. Housing
    3. Blade
    4. Guard
    5. Motor
    6. Rip fence bracket
    7. Wing nut (depth of cut)
    8. Wing nut (bevel cuts)
    9. Brush holders

C. Pedestal (Power) Grinder (Transparency 4)

    1. Wheel
    2. Flanged collars
    3. Clamping nut

INFORMATION SHEET

4. Blotting paper washer
5. Tool rest
6. Safety glass shield
7. Water pot
8. Wheel guard

D. Power Hack Saw or Metal Band Saw (Transparency 5)

1. Blade tension adjustment
2. Vise adjustment
3. Blade guides
4. Motor
5. Vise jaws
6. Blades
    a. Available in 8, 10, 14, & 24 teeth per inch
    b. Common blades for farm work are 10 and 14 teeth per inch.
    c. Use 10-point blade for cutting heavy metal and pipe. Use 14-point blade for thin metal

V. Safety Rules

A. Drill Press

1. Use a brush to remove cuttings from table
2. Do not wear loose-fitting clothes
3. Feed the bit slowly into the material to be drilled
4. Use goggles
5. Don't leave the chuck wrench in chuck
6. Don't hold work with hands, use clamp
7. Don't try to stop a revolving piece of work. Cut off the power and free the bit.

INFORMATION SHEET

B. Portable Electric Saw

1. Do not saw in an awkward position
2. Do not reach around in front of saw
3. Keep saw away from all parts of body
4. Never use without guard
5. Be sure guard works freely
6. Saw in a clean area
7. Be sure blade is sharp
8. Don't push a saw too rapidly
9. If saw binds, back out slowly
10. Don't saw over cord
11. Be sure saw is grounded properly
12. Wear safety goggles

C. Power Grinder

1. Wear safety goggles
2. Do not wear loose clothing
3. Adjust safety glass shields
4. Stand at one side of the wheel when operating the grinder
5. Support work on the tool rest while grinding
6. Cool work in water pot as it becomes heated

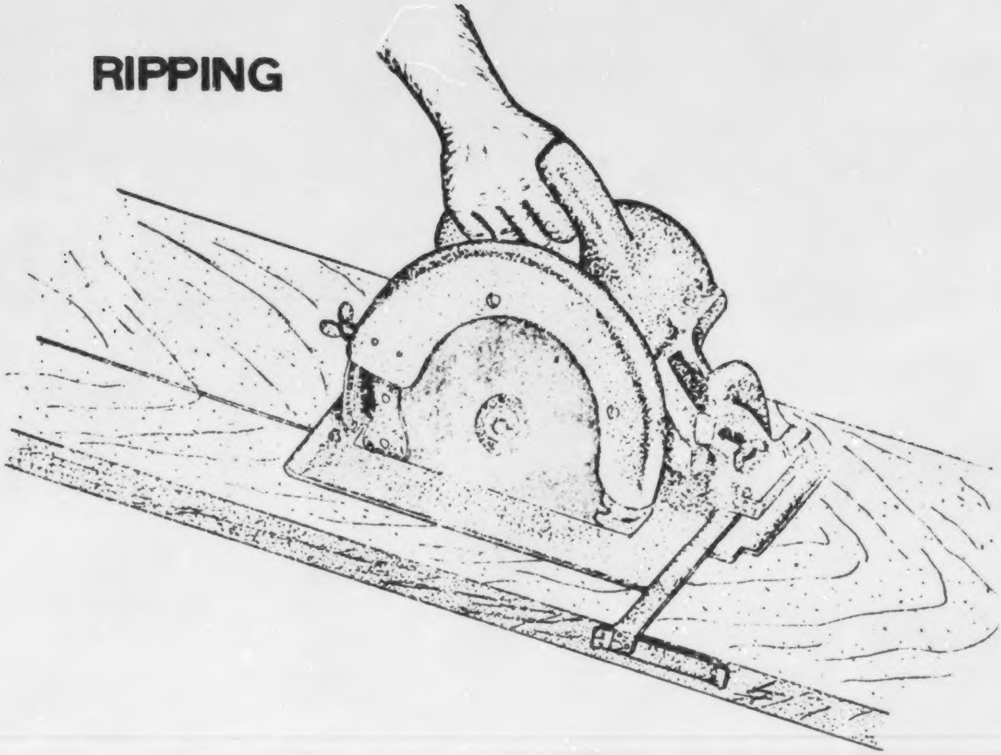
D. Power Hack Saw or Metal Band Saw

1. Wear safety goggles
2. Be sure the work is secure in vise
3. Do not wear loose-fitting clothes
4. Never allow scraps and metal to accumulate around saw

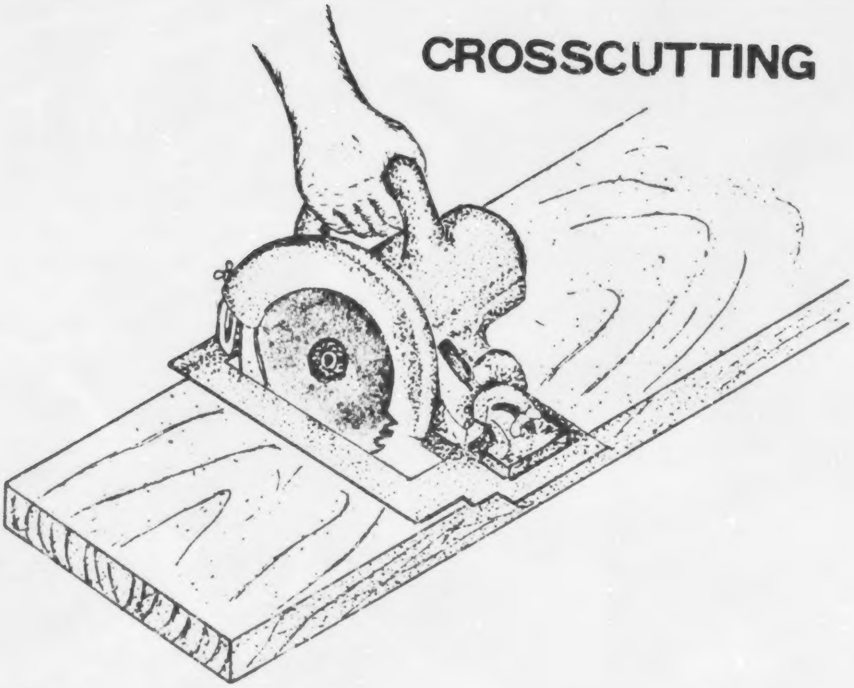
INFORMATION SHEET

5. Support long or heavy pieces
6. Always watch the saw while it is in operation
7. Stop the saw before adjusting or oiling

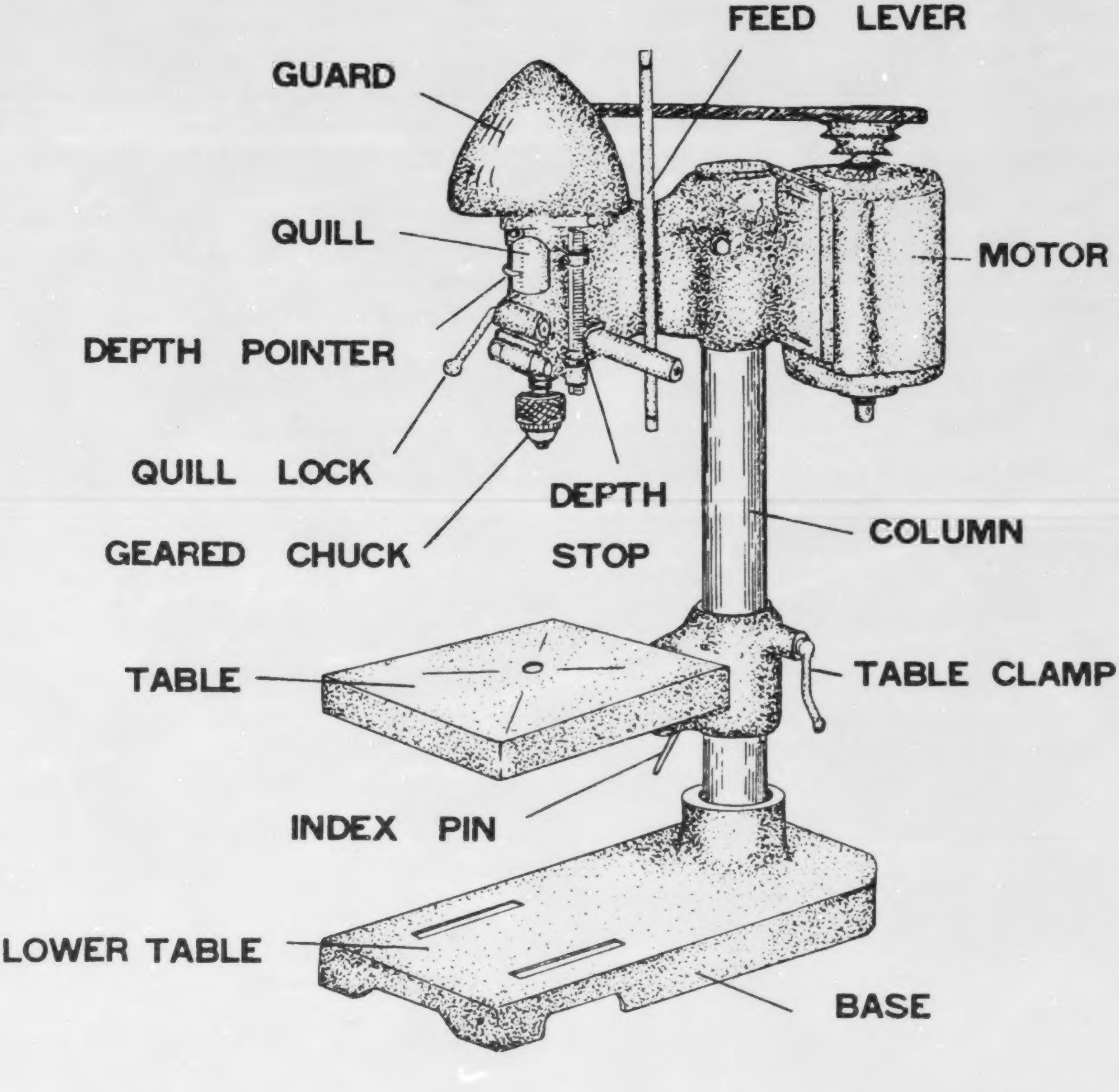
RIPPING



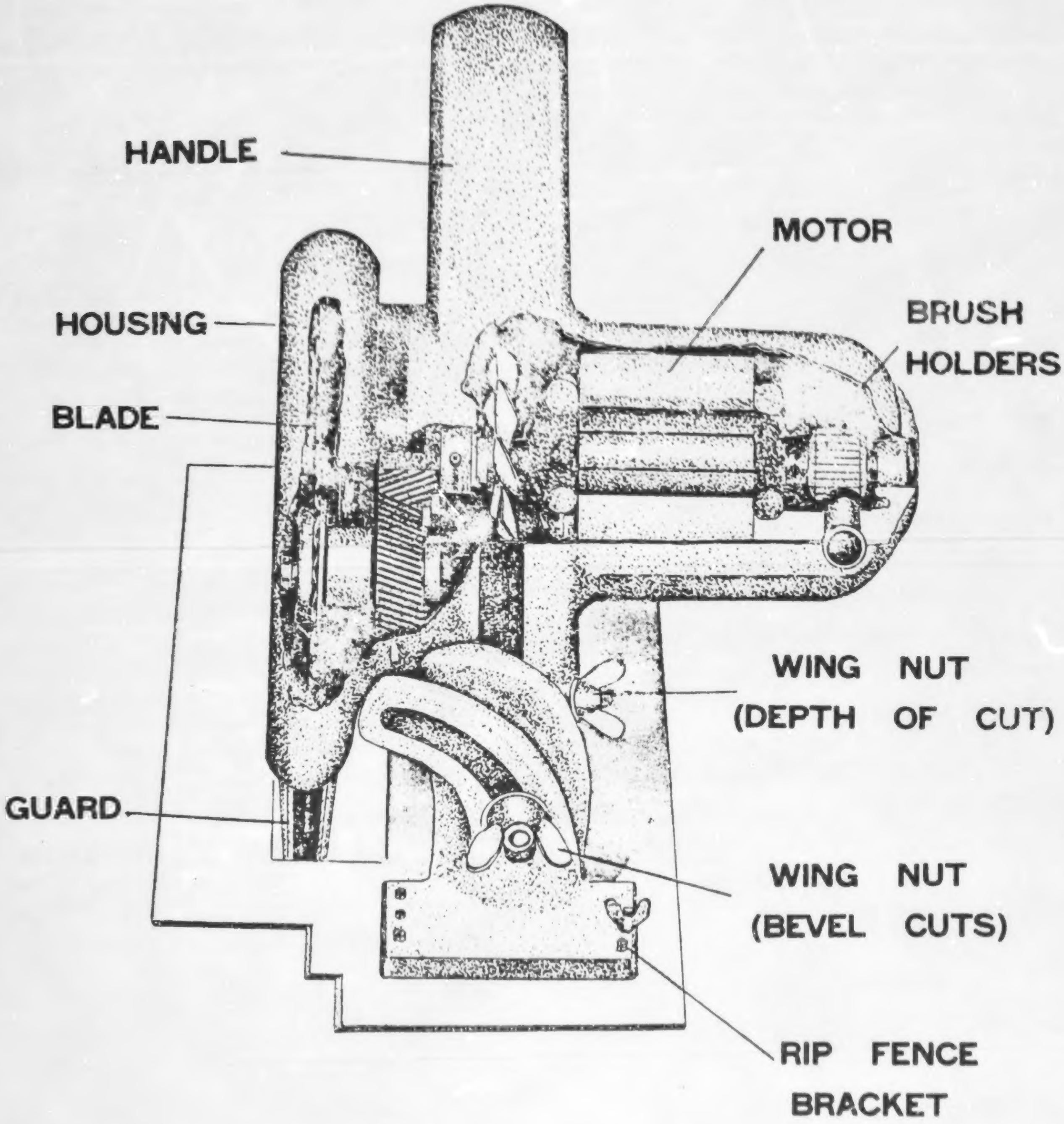
CROSSCUTTING



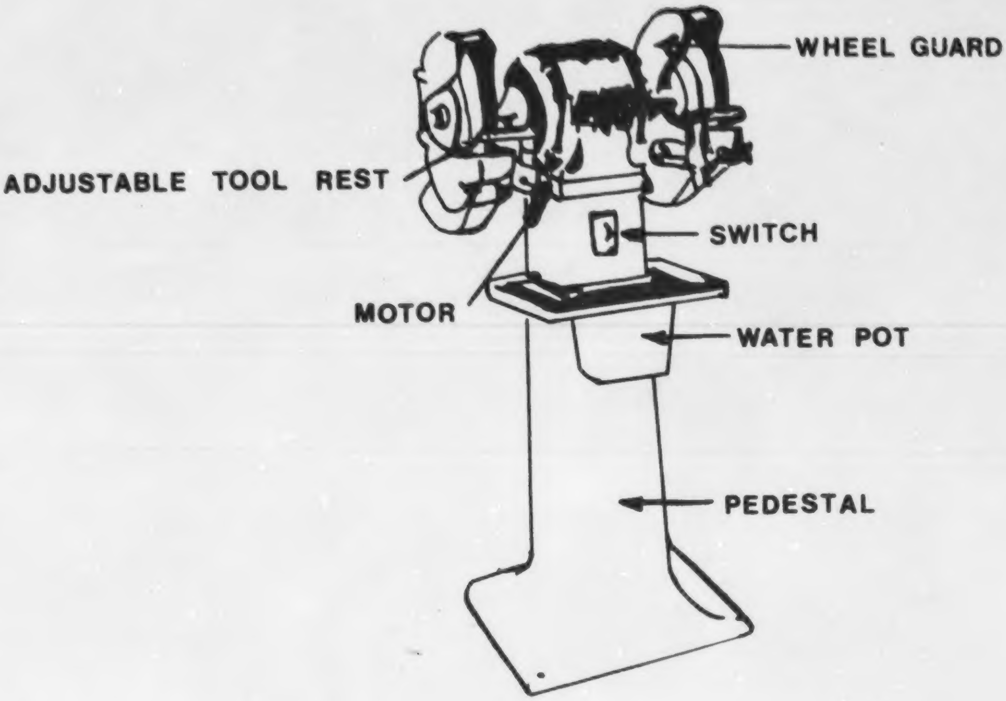
BENCH MODEL DRILL PRESS


FEED LEVER
GUARD
QUILL
MOTOR
DEPTH POINTER
QUILL LOCK
DEPTH STOP
GEARED CHUCK
COLUMN
TABLE
TABLE CLAMP
INDEX PIN
LOWER TABLE
BASE

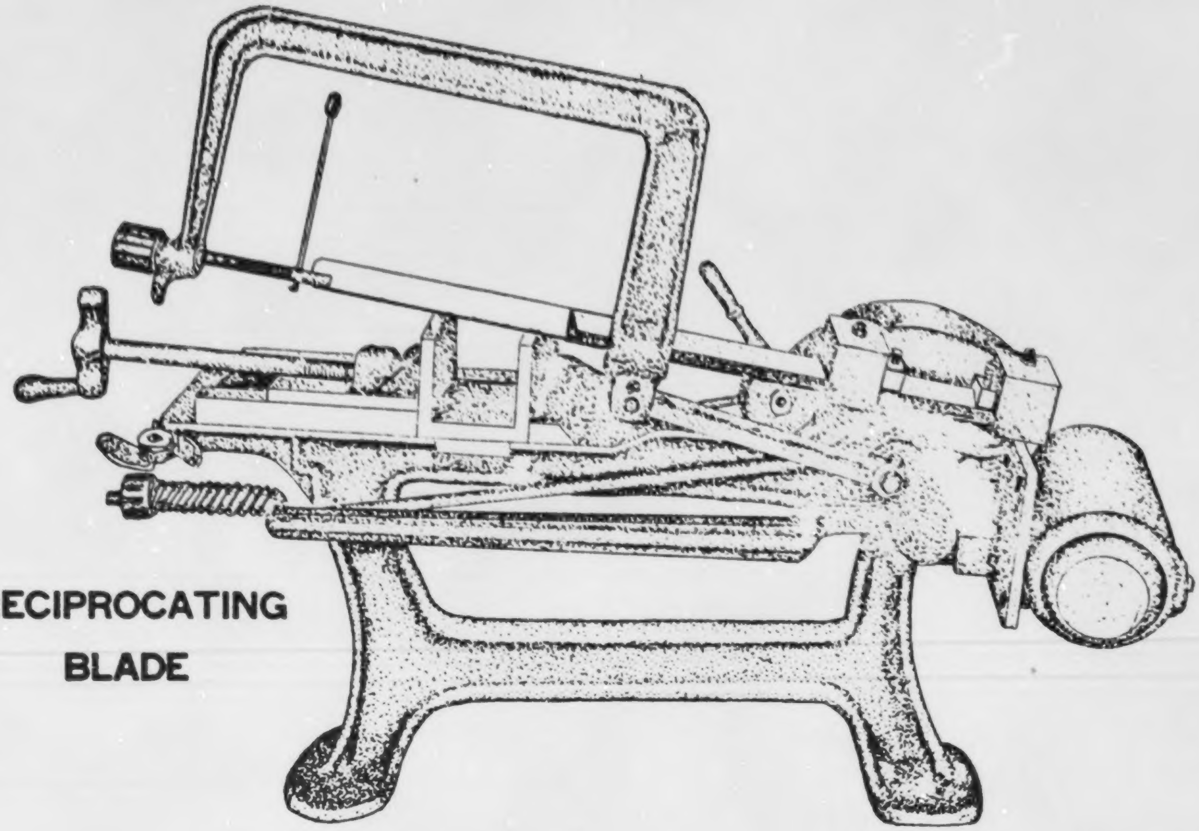
PORTABLE ELECTRIC SAW


HANDLE
MOTOR
BRUSH HOLDERS
HOUSING
BLADE
WING NUT (DEPTH OF CUT)
GUARD
WING NUT (BEVEL CUTS)
RIP FENCE BRACKET

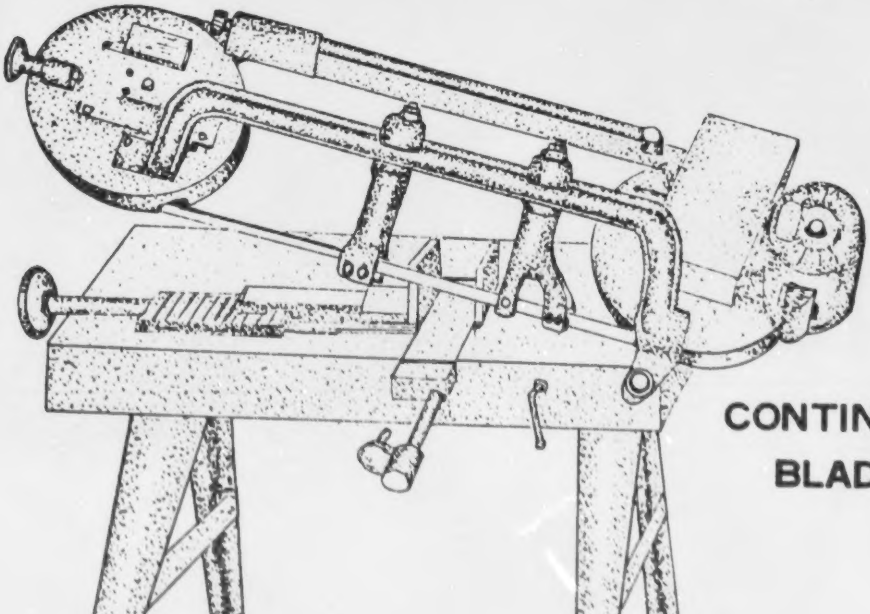
PEDESTAL POWER GRINDER


WHEEL GUARD
ADJUSTABLE TOOL REST
SWITCH
MOTOR
WATER POT
PEDESTAL

POWER HACKSAWS

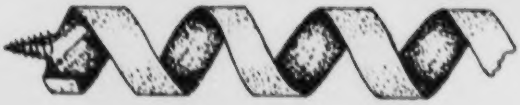


RECIPROCATING BLADE

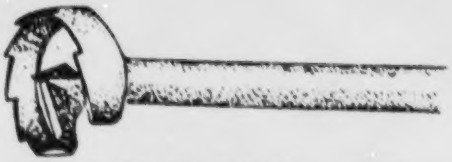


CONTINUOUS BLADE

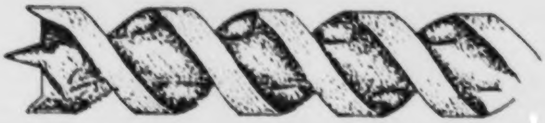
WOOD BITS



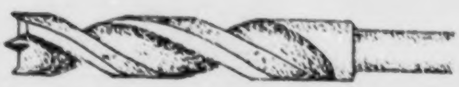
HOLLOW SPIRAL BIT



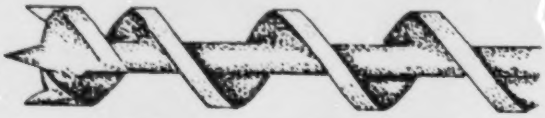
MULTI-SPUR BIT



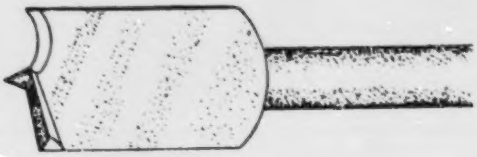
DOUBLE SPUR BIT (FLUTED)



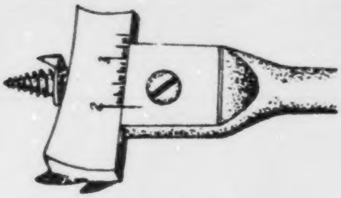
SPUR BIT



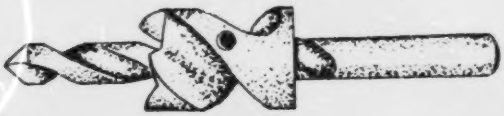
DOUBLE SPUR BIT (SOLID CENTER)



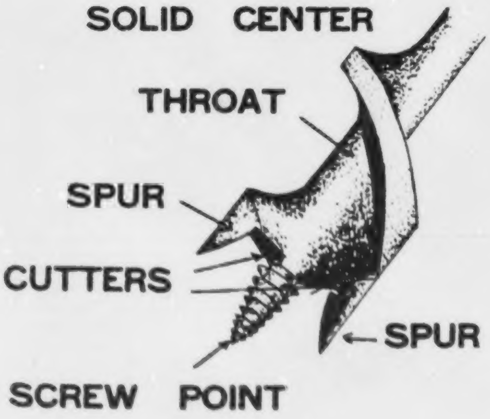
CENTER BIT



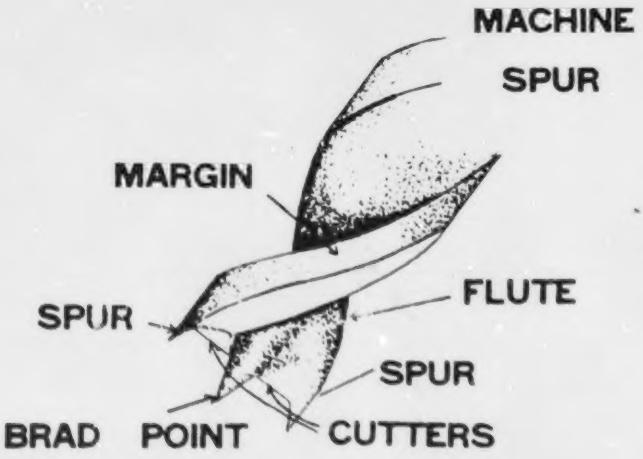
EXPANSIVE BIT



COUNTERSINK BIT

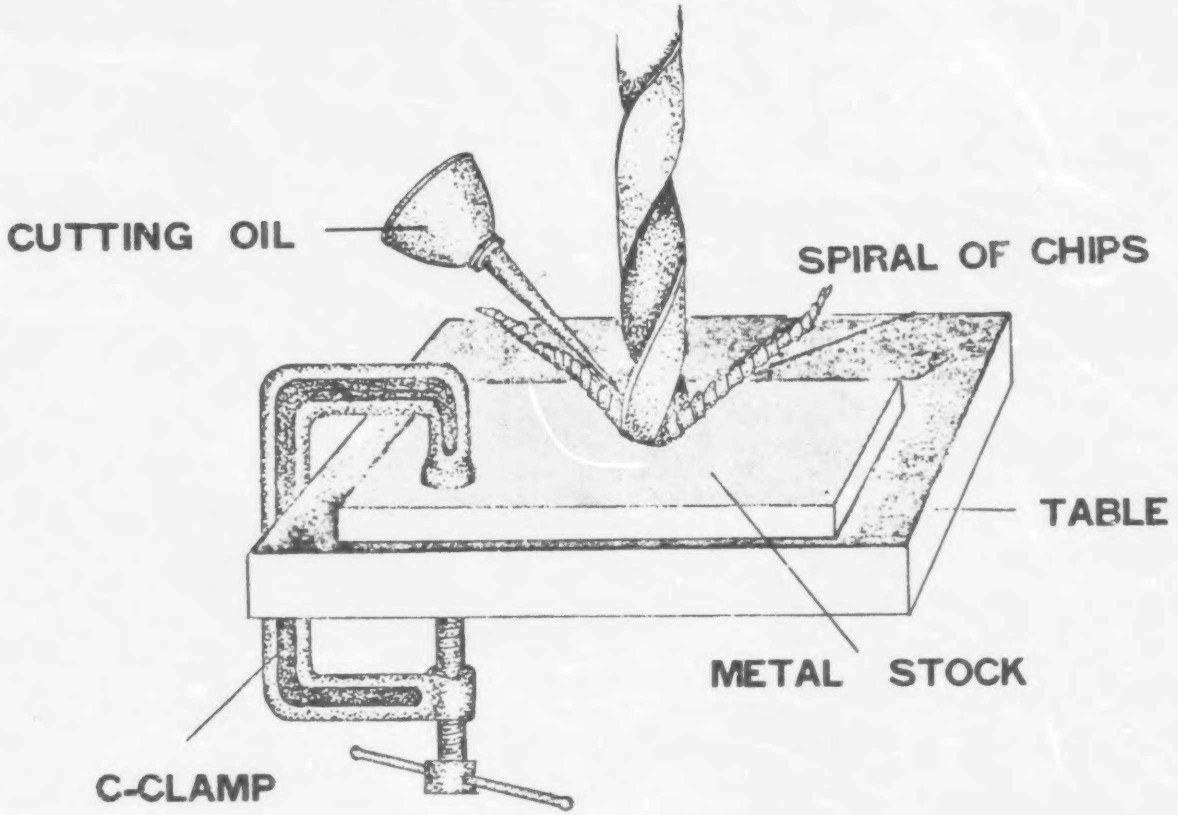


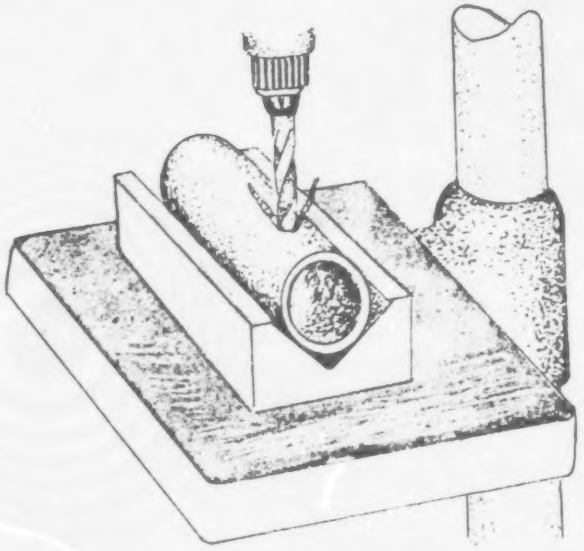
SOLID CENTER
THROAT
SPUR
CUTTERS
SPUR
SCREW POINT



MACHINE SPUR
MARGIN
FLUTE
SPUR
SPUR
BRAD POINT
CUTTERS

DRILLING METAL


CUTTING OIL
SPIRAL OF CHIPS
TABLE
METAL STOCK
C-CLAMP



V-BLOCK FOR ROUND STOCK

IDENTIFICATION AND SAFE USE OF POWER TOOLS
UNIT XI

JOB SHEET #1 - DRILLING HOLES IN METAL AND WOOD

I. Tools and Equipment

- A. Drill Press
- B. Safety goggles
- C. Wire Brush

II. Materials

- A. 6" piece of 2" diameter steel pipe
- B. Wood 2" x 4" x 6"

III. Procedures

- A. The stock is marked at the center of the hole to be drilled, use a scratch awl for wood and center punch for metal to keep drill from crawling
- B. Hold stock securely on table with C-clamp or drill press vise or V-block for pipe (Transparency 7)
- C. When drilling wood put backing lumber under the stock to make holes smooth and to keep from tearing
- D. Use cutting oil while drilling metal
    - 1. Oil cools cutting lips and stock
    - 2. Oil lubricates chips
    - 3. Oil improves the finish of holes
    - 4. Oil lengthens the life of the drill
- E. Apply steady pressure to feed lever till drill penetrates through stock

IDENTIFICATION AND SAFE USE OF POWER TOOLS
UNIT XI

JOB SHEET #2 - SAWING WOOD WITH A PORTABLE ELECTRIC SAW

I. Tools and equipment

  A. Portable electric saw

  B. Safety goggles

  C. Marking pencil

II. Materials:

  Lumber - 1" X 4" X 24"

III. Procedures

  A. Mark the line for the cut

  B. Lay the tip of the shoe on the board

  C. Line the sighting slot or V with the marked line and press the trigger switch

  D. When blade is at full speed, move the blade into the board with the guide slot moving along the line to be cut

  E. Grip saw firmly, holding the shoe flat against the stock

  F. Allow waste to fall free

  G. When ripping use rip fence or rip guide for accurate cuts (Transparency 1)

IDENTIFICATION AND SAFE USE OF POWER TOOLS
UNIT XI

JOB SHEET #3 - CUTTING PIPE WITH A METAL BAND SAW OR POWER HACK SAW

I. Tools and equipment

A. Power hack saw or metal band saw

B. Marking chalk

C. Safety goggles

II. Materials:

Piece of 2" diameter pipe 4" long

III. Procedures

A. Mark stock for cut

B. Place stock in vise jaws and tighten

C. Start blade and feed blade into stock slowly to avoid bending the the teeth

D. Never use a new blade in an old cut because the new blade is wider and will damage the teeth

E. Do not apply too much feed at first on a new blade

F. Keep guides as close to the vice jaws as possible

G. If stock is long, use a stock stand

H. Use enough tension to keep blades from slipping on the drive wheels

I. Keep automatic stop switch adjusted to stop blade as soon as the cut is completed

J. When cut is finished let waste fall free

K. Remove stock from vise jaws

IDENTIFICATION AND SAFE USE OF POWER TOOLS
UNIT XI

TEST

1. Match the following terms:

_____a. guard   1. Tool for holding round stock
_____b. stock   2. Cutting wood along or with the grain
_____c. V-block   3. Cutting on an angle
_____d. ripping   4. Safety device for protecting the operator
_____e. bevel   5. Material to be worked on

2. Name a use of the following power tools.

   a. Drill press -

   b. Portable electric saw -

   c. Pedestal (power) grinder -

   d. Power hack saw or metal band saw -

3. Identify the following power tools as shown by the instructor.

   a.

   b.

   c.

   d.

4. List three safety rules for each of the following power tools.

   a. drill press

      1.

      2.

      3.

   b. portable electric saw

      1.

      2.

      3.

c. pedestal (power) grinder

1.

2.

3.

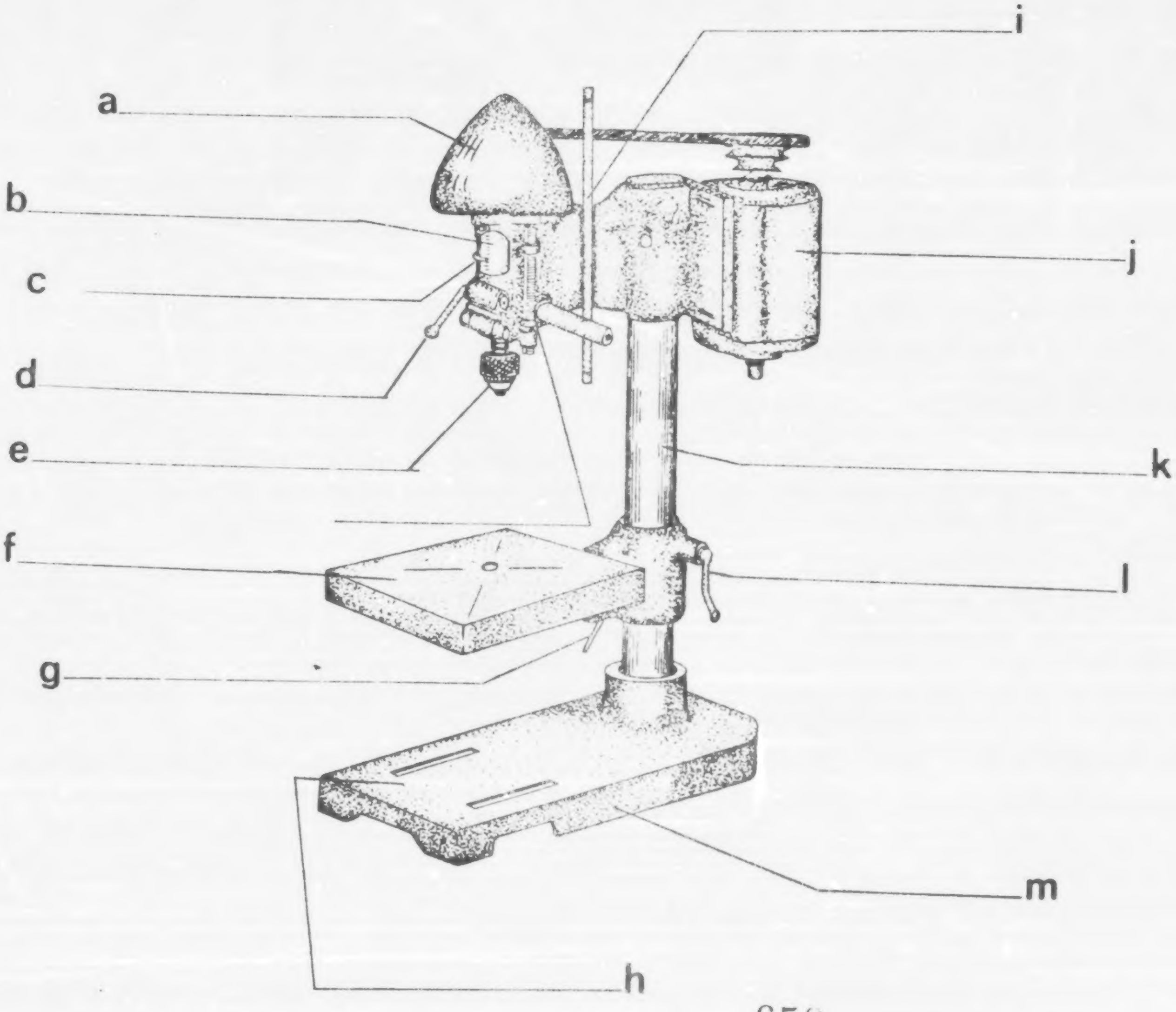
d. power hacksaw or metal bandsaw

1.

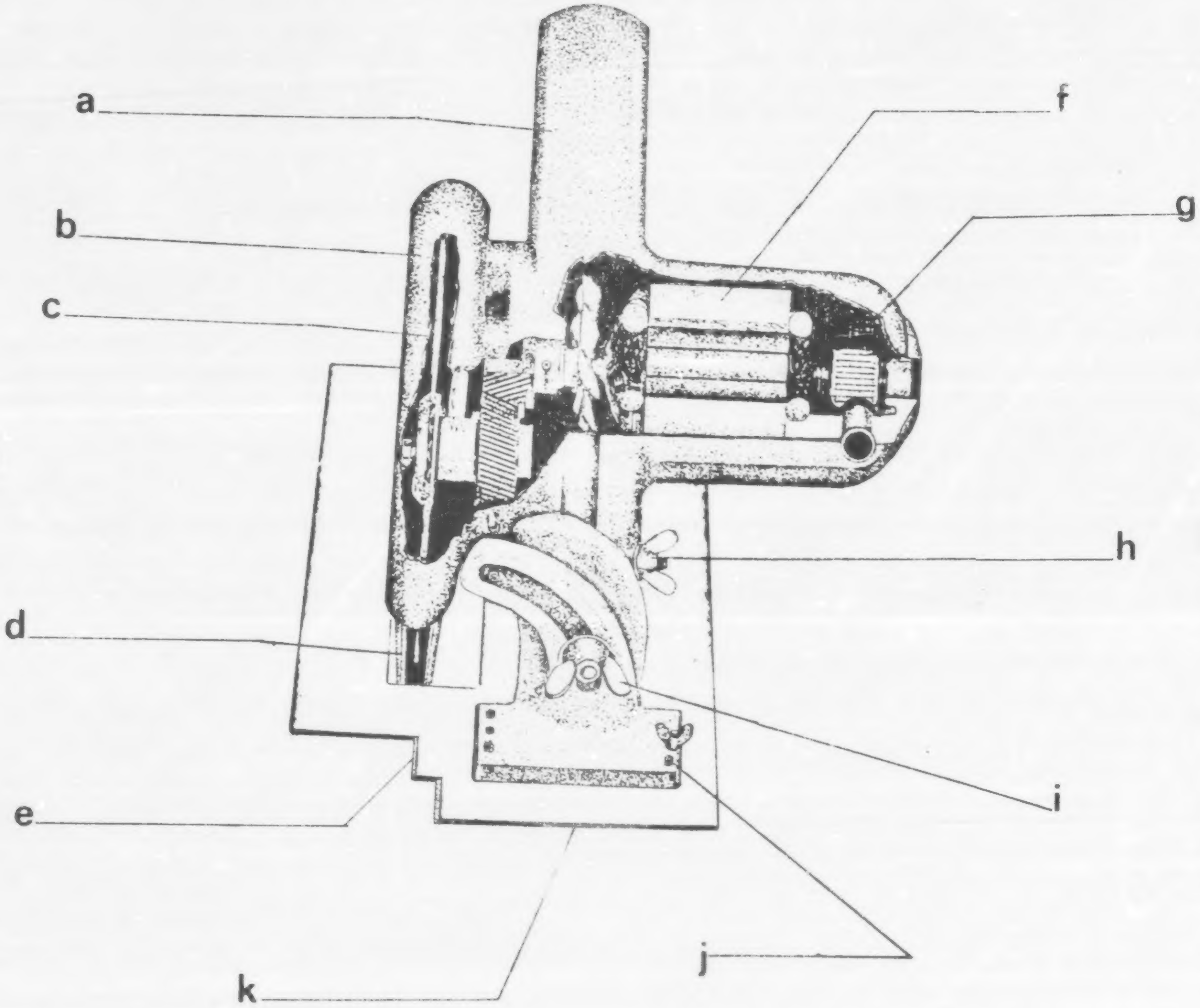
2.

3.

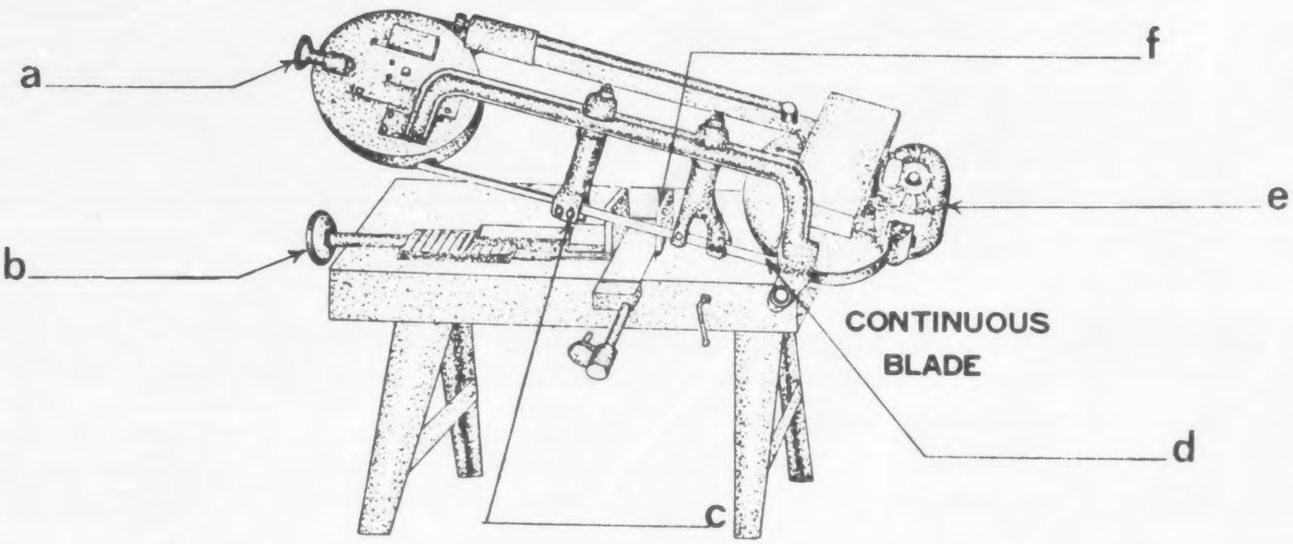
5. Identify the following parts of the drill press.


i
a
b
c
j
d
e
k
f
l
g
m
h

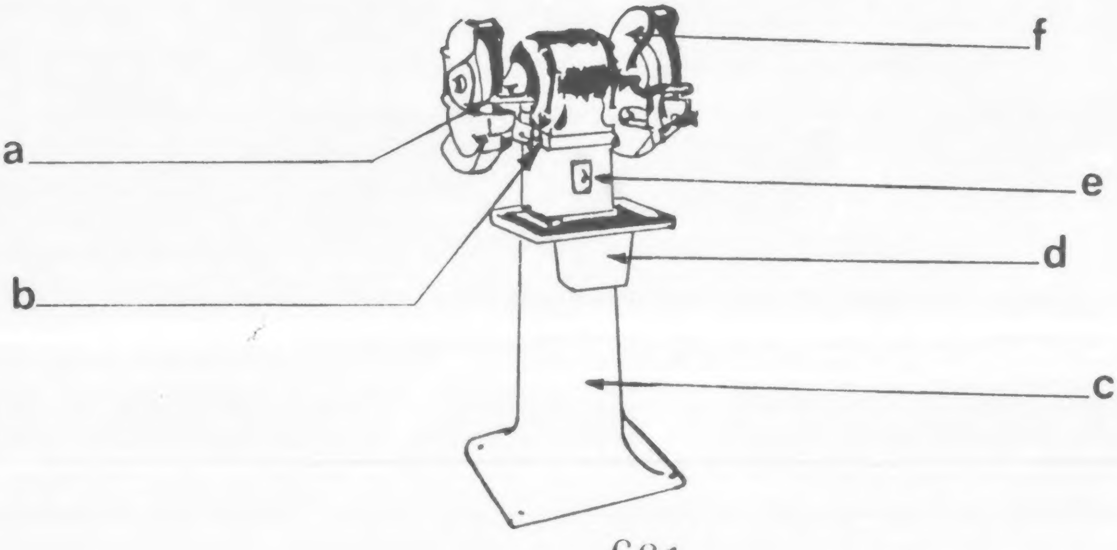
6. Identify the following parts of the portable electric saw.


a
b
c
d
e
f
g
h
i
j
k

7. Identify the following parts ot the power hacksaw.


a
b
c
d
e
f
CONTINUOUS
BLADE

8. Identify the following parts of the pedestal (power) grinder.



IDENTIFICATION AND SAFE USE OF POWER TOOLS
UNIT XI

ANSWERS TO TEST

1. a. 4

   b. 5

   c. 1

   d. 2

   e. 3

2. a. drill holes in wood or metal

   b. ripping and cross cutting wood

   c. smooth metal, sharpen tools, or remove small amounts of metal

   d. cutting various types of metal at any desired angle quickly

3. Based on instructor's examples

4. a. any three of the following

      1. Use a brush to remove cuttings from table
      2. Do not wear loose-fitting clothes
      3. Feed the bit slowly into the material to be drilled
      4. Use goggles
      5. Don't leave the chuck wrench in chuck
      6. Don't hold work with hands, use clamp
      7. Don't try to stop a revolving piece of work. Cut off the power and free the bit

   b. any three of the following

      1. Do not saw in an awkward position
      2. Do not reach around in front of saw
      3. Keep saw away from all parts of body
      4. Never use without guard

    5. Be sure guard works freely
    6. Saw in a clean area
    7. Be sure blade is sharp
    8. Don't push a saw too rapidly
    9. If saw binds, back out slowly
    10. Don't saw over cord
    11. Be sure saw is grounded properly
    12. Wear safety goggles

c. any three of the following

    1. Wear safety goggles
    2. Do not wear loose clothing
    3. Adjust safety glass shields
    4. Stand at one side of the wheel when operating the grinder
    5. Support work on the tool rest while grinding
    6. Cool work in water pot as it becomes heated

d. any three of the following

    1. Wear safety goggles
    2. Be sure the work is secure in vise
    3. Do not wear loose-fitting clothes
    4. Never allow scraps and metal to accumulate around saw
    5. Support long or heavy pieces
    6. Always watch the saw while it is in operation
    7. Stop the saw before adjusting or oiling

5. a. guard
   b. quill
   c. depth pointer
   d. quill lock
   e. geared chuck
   f. table
   g. index pin
   h. lower table

i. feed lever

j. motor

k. column

l. table clamp

m. base

n. depth stop

6. a. handle

b. housing

c. blade

d. guard

e. guide slot

f. motor

g. brush holders

h. wing nut (depth of cut)

i. wing nut (bevel cuts)

j. rip fence bracket

k. shoe

7. a. blade tension adjustment

b. vice adjustment

c. blade guides

d. blade

e. motor

f. vice jaws

8. a. adjustable tool rest

b. motor

c. pedestal

d. water pot

e. switch

f. wheel guard